

COLUMBIA ET. AL KOTANEELEE YT I-48

AOF WELL TEST

COLUMBIA ET AL KOTANEELEE

YT I-48

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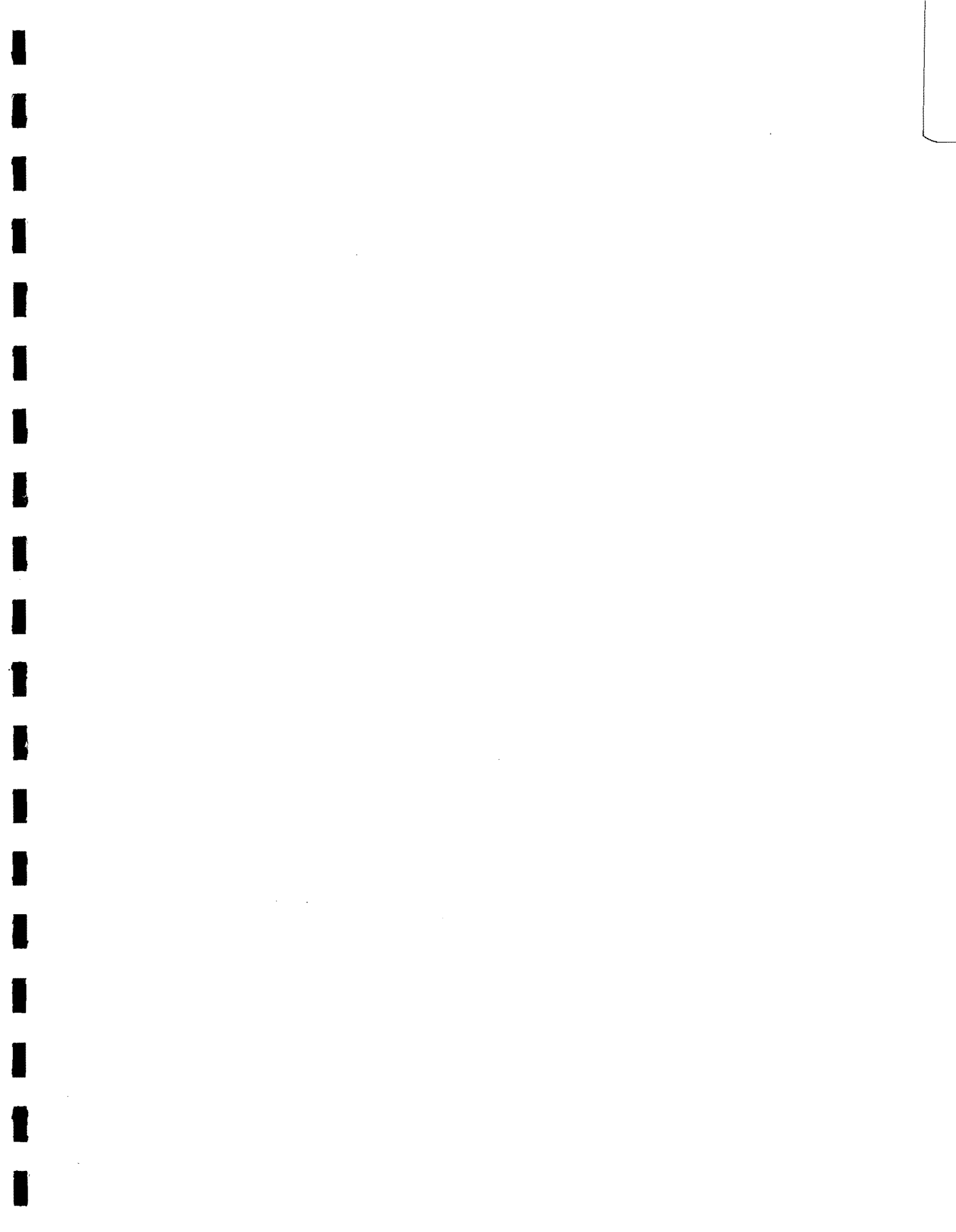
SUMMARY

Columbia et al Kotaneelee YT I-48

The producing Nahanni formation of this well was tested for AOF potential during the month of June 1980. The modified isochronal test procedure was used to obtain the AOF potential of this well. The following results were obtained from the test data:

1. Shut in reservoir pressure 33 956 kPa (5650 psia).
2. Shut in wellhead pressure 31 103 kPa (4511 psia).
3. The sandface AOF at stable conditions is 12931 E3M3 (459.037 MMcfd).
4. The wellhead AOF at stable conditions is 1503.3 E3M3 (53.366 MMcfd).
5. The "N" was calculated to be 0.500 for both the wellhead and sandface AOF.
6. The sandface "C" was calculated to be 0.33193 E3M3/kPa² (0.8125 E-01 MMcfd/psia²).
7. The wellhead "C" was calculated to be 0.48332 E-01 E3M3/kPa² (0.1183 E-01 MMcfd/psia²).

The method of testing, assumptions, calculations, plot of sandface and wellhead OAF, wellhead deliverability and all test data are in the following sections.



TEST PROCEDURE

During the month of June, 1980, an AOF test was conducted on the producing formation (Nahanni) of the Columbia et al Kotaneelee YT I-48 well, after the well had been stimulated. A modified isochronal procedure was used to obtain the AOF potential.

The bottom hole pressures were measured with bottom hole pressure recorders and surface measurements were made with a dead weight tester.

A separator was installed on the flow line and the well was produced in four hour intervals. The well was produced at rates of 839.6 E3M3 (29.8 MMcfd), 986.1 E3M3 (35 MMcfd) and 1211.5 E3M3 (43 MMcfd) for the test. The stabilized flow was obtained at a rate of 1411.5 E3M3 (50.1 MMcfd).

Columbia et al Kotaneelee YT I-48

Metric Units

Gas Well Back Pressure Test Results

Specific Gas Gravity	0.719
Formation Temperature	177°C
Critical Pressure	4585 kPa
Critical Temperature	221°K
H ₂ S Content	2.36 MOL %
CO ₂ Content	13.55 MOL %
Stabilized Wellhead Pressure	31 103.4 kPa
Stabilized Bottom Hole Pressure	38 956.8 kPa
Tubing Size	88.9 mm

Gas Rate E3M3	WH °C	WHP Flow kPa	WHP Stat kPa	BHP Flow kPa	BHP Stat kPa	(Pp ² - Ps ²) E3 kPa ²	(Pc ² - Pw ²) E3 kPa ²
839.6	79.5	26249	30924	38826	38922	7505	267275
986.1	80.6	22174	30545	38729	38895	12845	441287
1211.5	81.8	17244	31007	38660	38860	15501	664053
1411.5	85.7	9970	30855	38440	38674	18078	852632

Wellhead Coefficients

N = 0.500

C = 0.51348 E-01 E3M3/kPa²

AOF = 1597.1 E3M3

Sandface Coefficients

N = 0.500

C = 0.30643 E3M3/kPa²

AOF = 11937.4 E3M3

@ Stabilized Conditions

N = 0.500

C = 0.48332 E-01 E3M3/kPa²

AOF = 1503.3 E3M3

N = 0.500

C = 0.33193 E3M3/kPa²

AOF = 12931 E3M3

Columbia et al Kotaneelee YT I-48

English Units

Gas Well Back Pressure Test Results

Specific Gas Gravity	0.719
Formation Temperature	350 ^o F
Critical Pressure	665 psia
Critical Temperature	397 ^o R
H ₂ S Content	2.36 MOL %
CO ₂ Content	13.55 MOL %
Stabilized Wellhead Pressure	4511 psia
Stabilized Bottom Hole Pressure	5650 psia
Tubing Size	3.5" O.D.

Gas Rate MMcfd	WH Temp. °F	WHP Flow psia	WHP Stat psia	BHP Flow psia	BHP Stat psia	(P _f ² - P _s ²) psia ²	(P _c ² - P _w ²) psia ²
29.8	174	3807	4485	5631	5645	157864	5621977
35.0	176	3216	4430	5617	5641	270192	9282244
43.0	178	2501	4497	5607	5636	326046	13968009
50.1	185	1446	4475	5575	5609	380256	17934710

Wellhead Coefficients

N = 0.500

C = 0.1257 E-01 MMcfd/psia²

AOF = 56.695 MMcfd

Sandface Coefficients

N = 0.500

C = 0.7500 E-01 MMcfd/psia²

AOF = 423.763 MMcfd

@ Stabilized conditions

N = 0.500

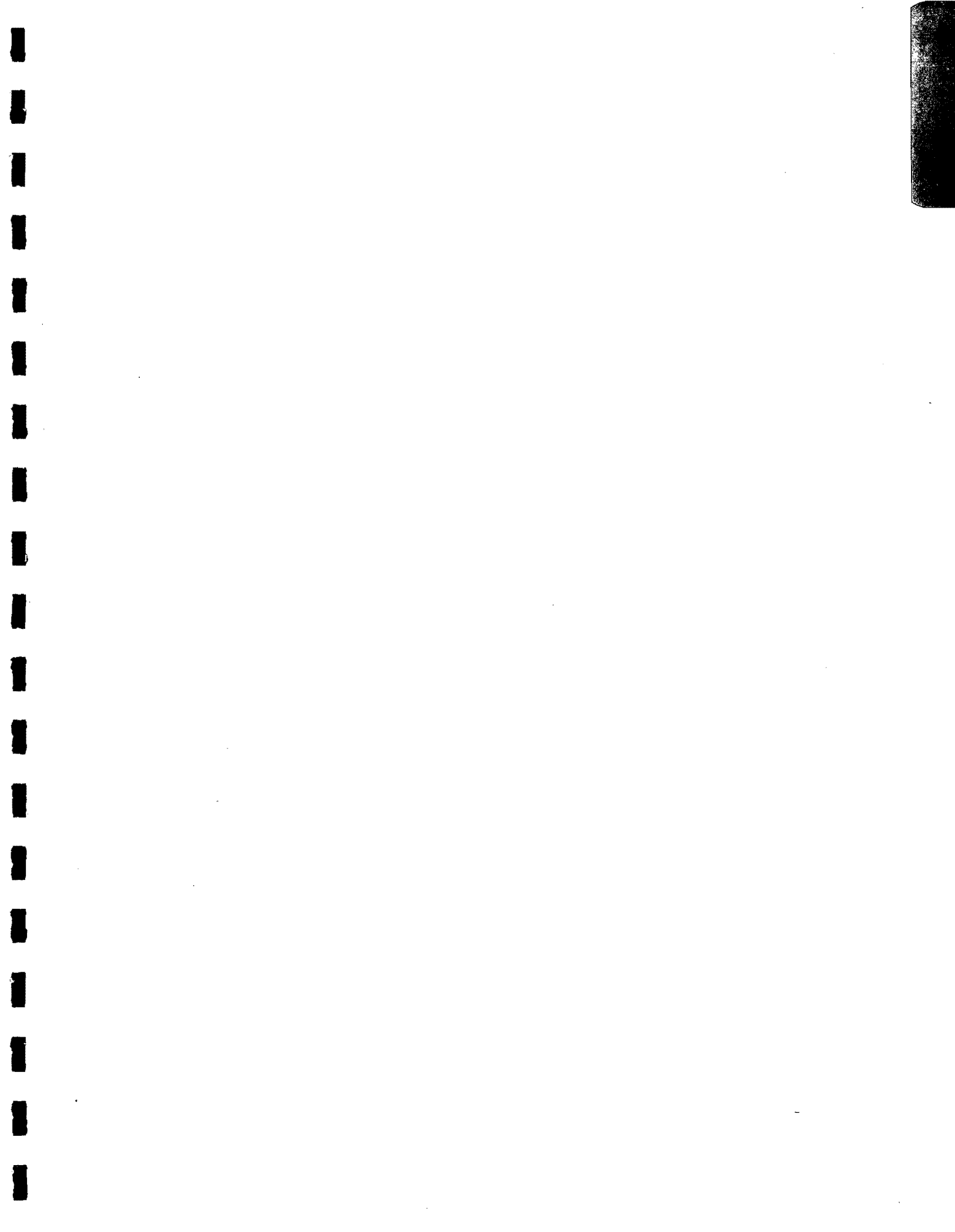
C = 0.1183 E-01 MMcfd/psia²

AOF = 53.366 MMcfd

N = 0.500

C = 0.8125 E-01 MMcfd/psia²

AOF = 459.037 MMcfd



COLUMBIA et al KOTANEELEE YT 1-48 WELLHEAD A.O.F.

METRIC UNITS

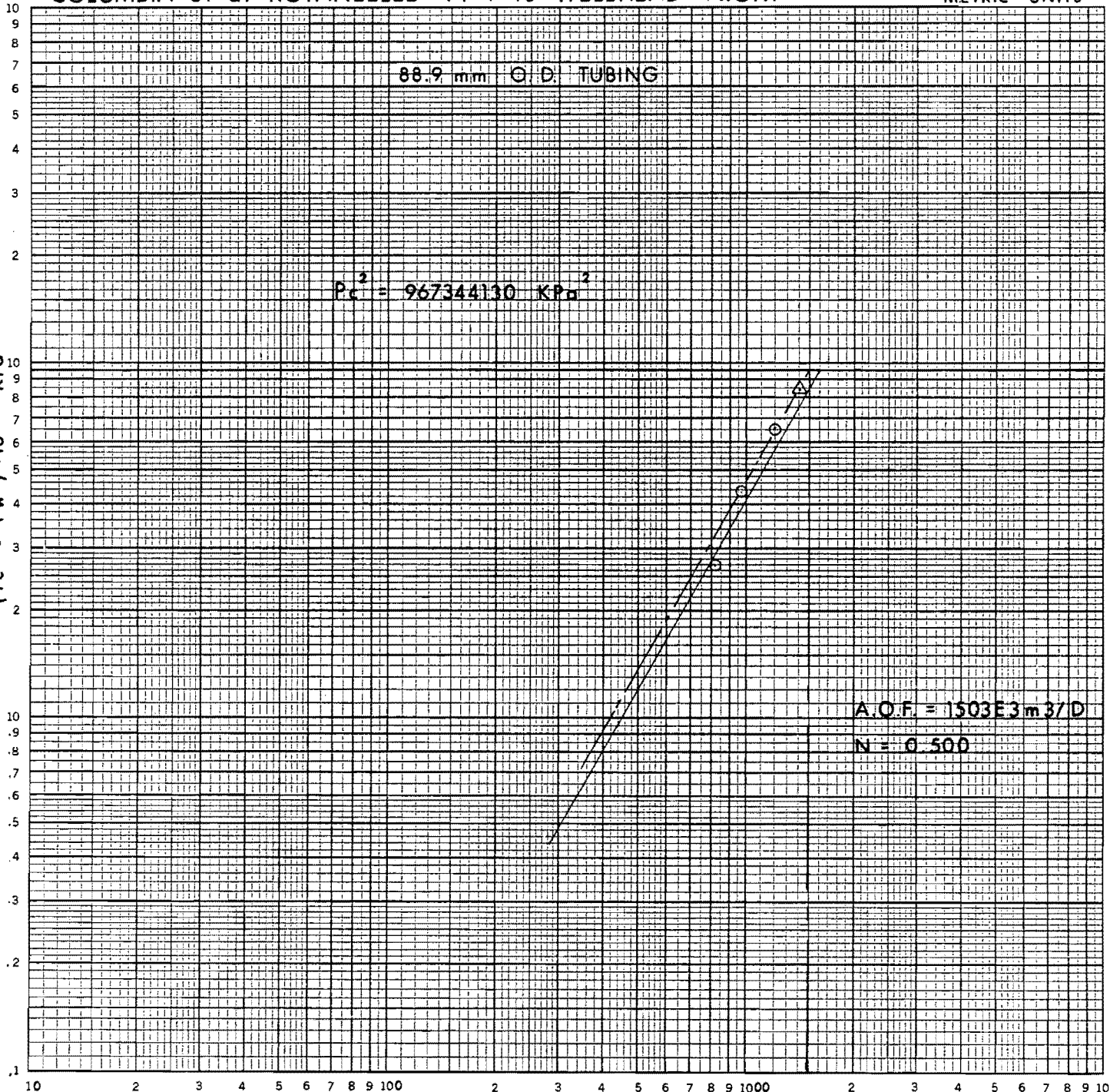
K+S LOGARITHMIC 3 X 3 CYCLES
 KEUFFEL & ESSER CO. MADE IN U.S.A.
 (Pc² - Pw²) x 10⁶ KPa² 46 7403

88.9 mm O.D. TUBING

$$P_c^2 = 967344130 \text{ KPa}^2$$

$$A.O.F. = 1503 \text{ E}3 \text{ m}^3/\text{D}$$

$$N = 0.500$$



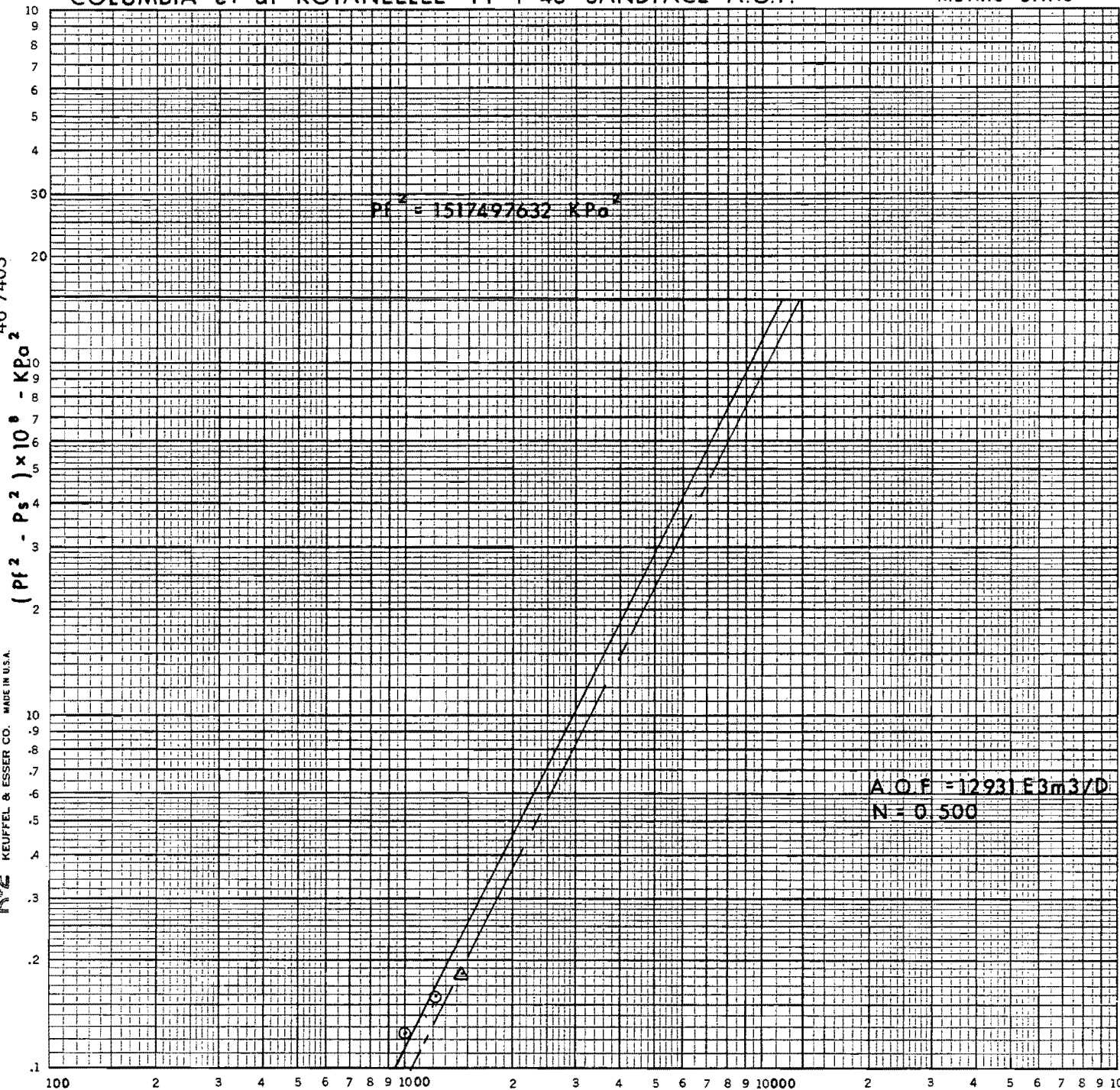
FLOW RATE (E3 m³/D)

COLUMBIA et al KOTANEELEE YT 1-48 SANDFACE A.O.F.

METRIC UNITS

46 7403

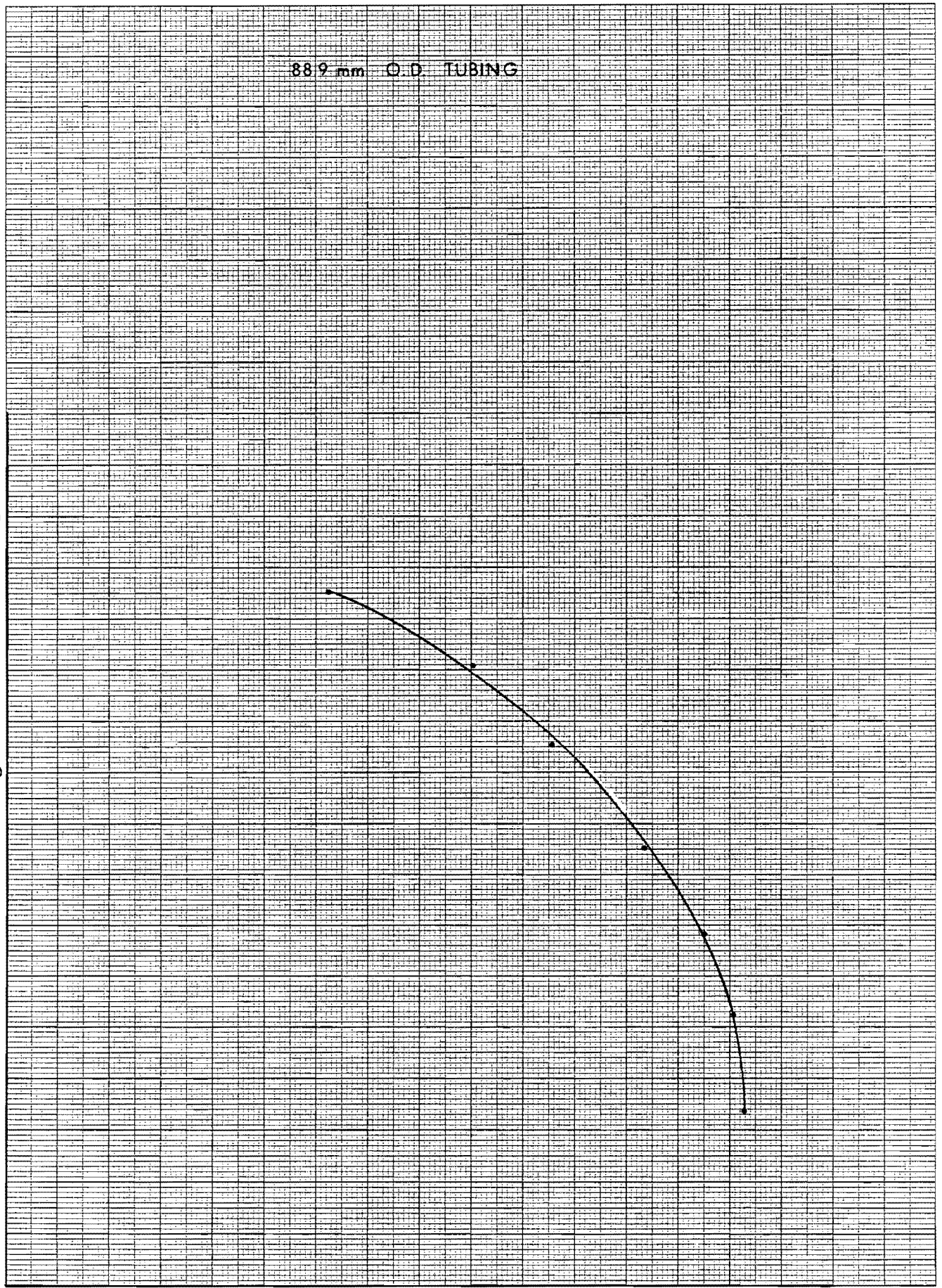
KE LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.



FLOW E3m3/D

46 1513

KE 10 X 10 TO THE CENTIMETER
KEUFFEL & ESSER CO. MADE IN U.S.A.



500

1000

1500

FLOW E 3 m 3 / D

COLUMBIA et al KOTANEELEE YT 1-48 WELLHEAD A.O.F.

ENGLISH UNITS

3.5" O.D. TUBING

$P_c = 20,349,000$

46 7403

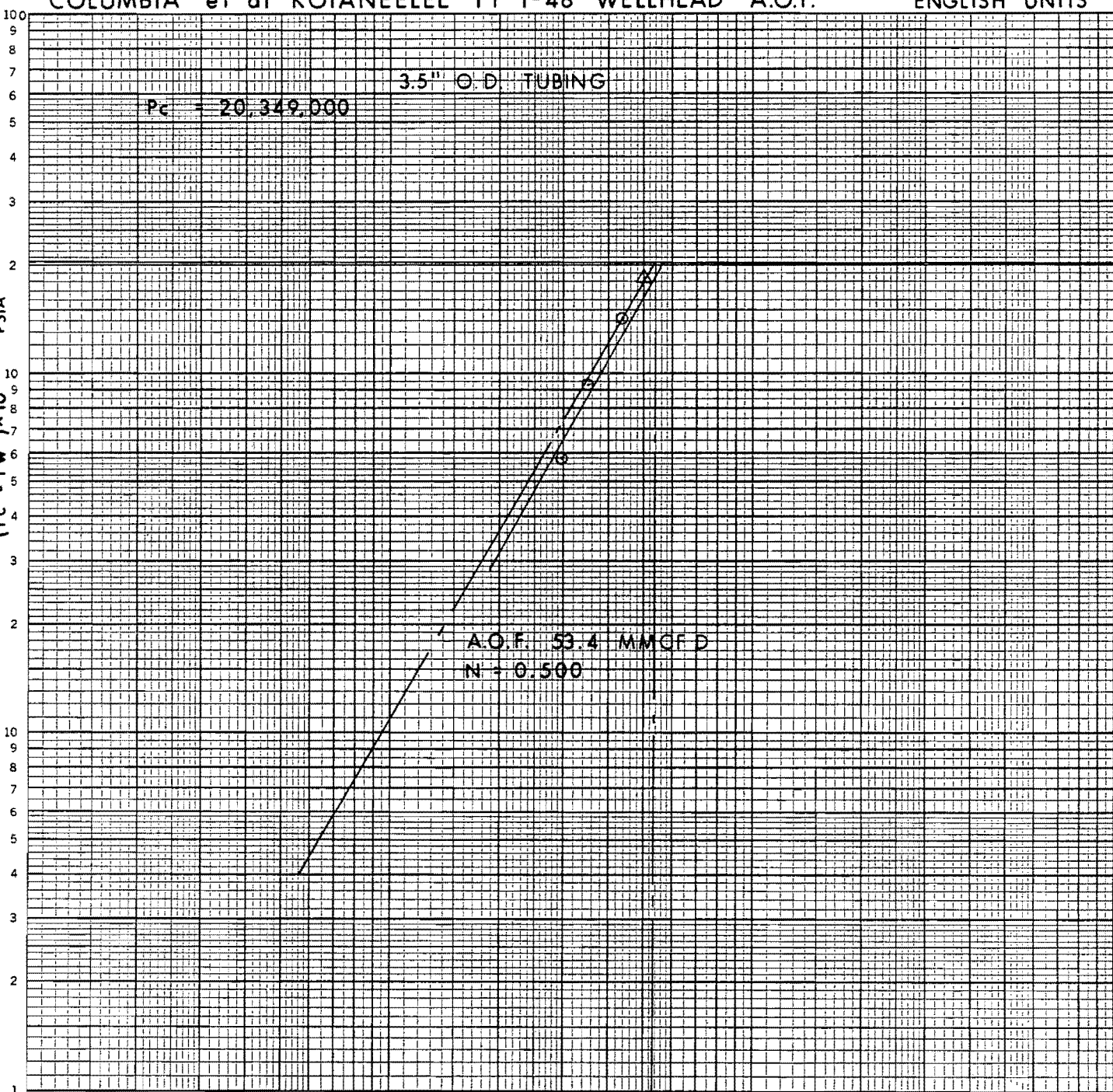
$(P_c^2 - P_w^2) \times 10^{-6} - \text{PSIA}^2$

LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

A.O.F. 53.4 MMCFD
N = 0.500

1 2 3 4 5 6 7 8 9 10 2 3 4 5 6 7 8 9 100 2 3 4 5 6 7 8 9 10

FLOW (MMCFD)



COLUMBIA et al KOTANEELEE YT 1-48 SANDFACE A.O.F.

ENGLISH UNITS

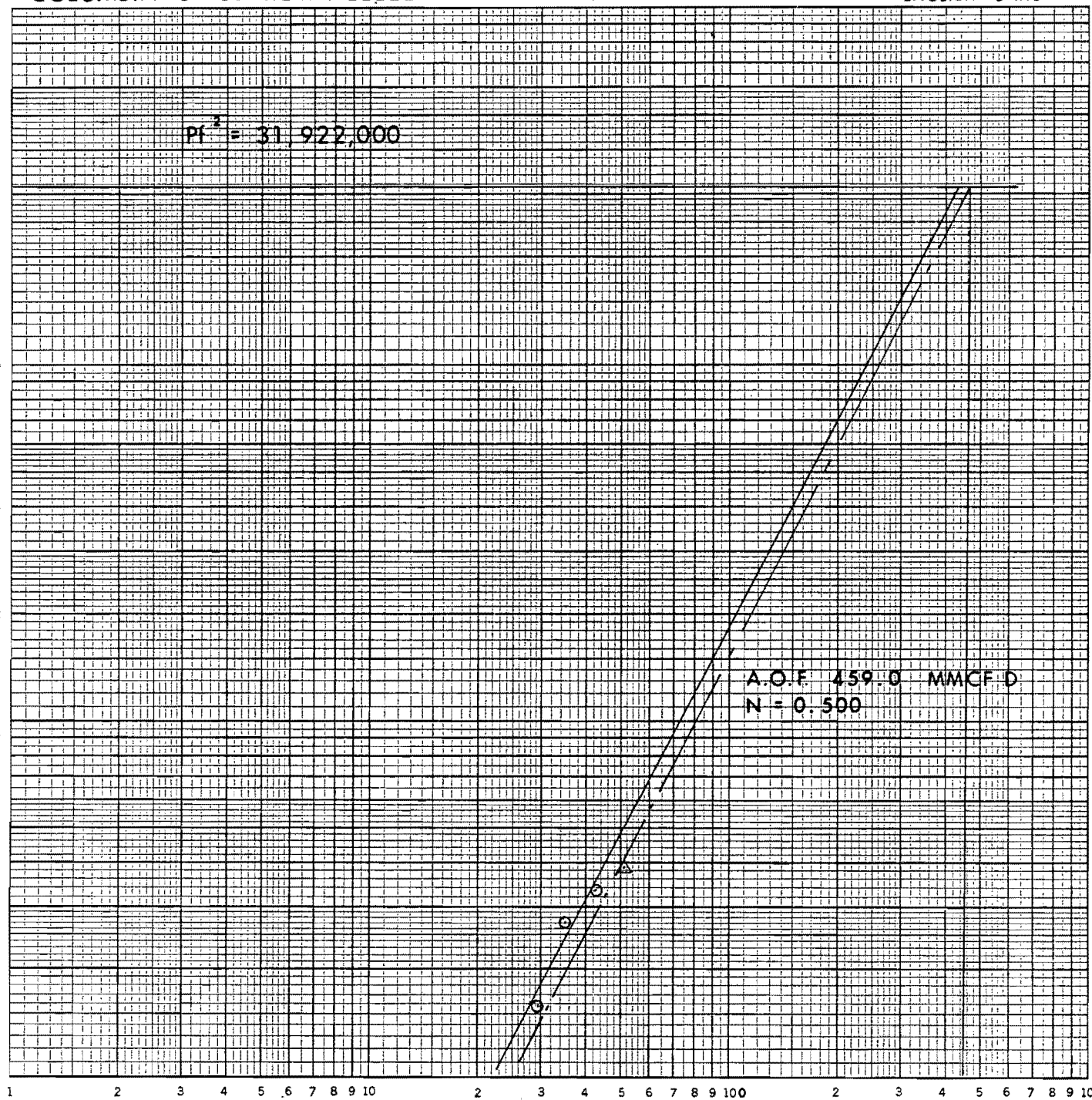
46 7403

$(P_f - P_s) \times 10^{-6} - \text{PSIA}^2$

LOGARITHMIC 3 X 3 CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

$P_f^2 = 31,922,000$

A.O.F. 459.0 MMCF-D
N = 0.500

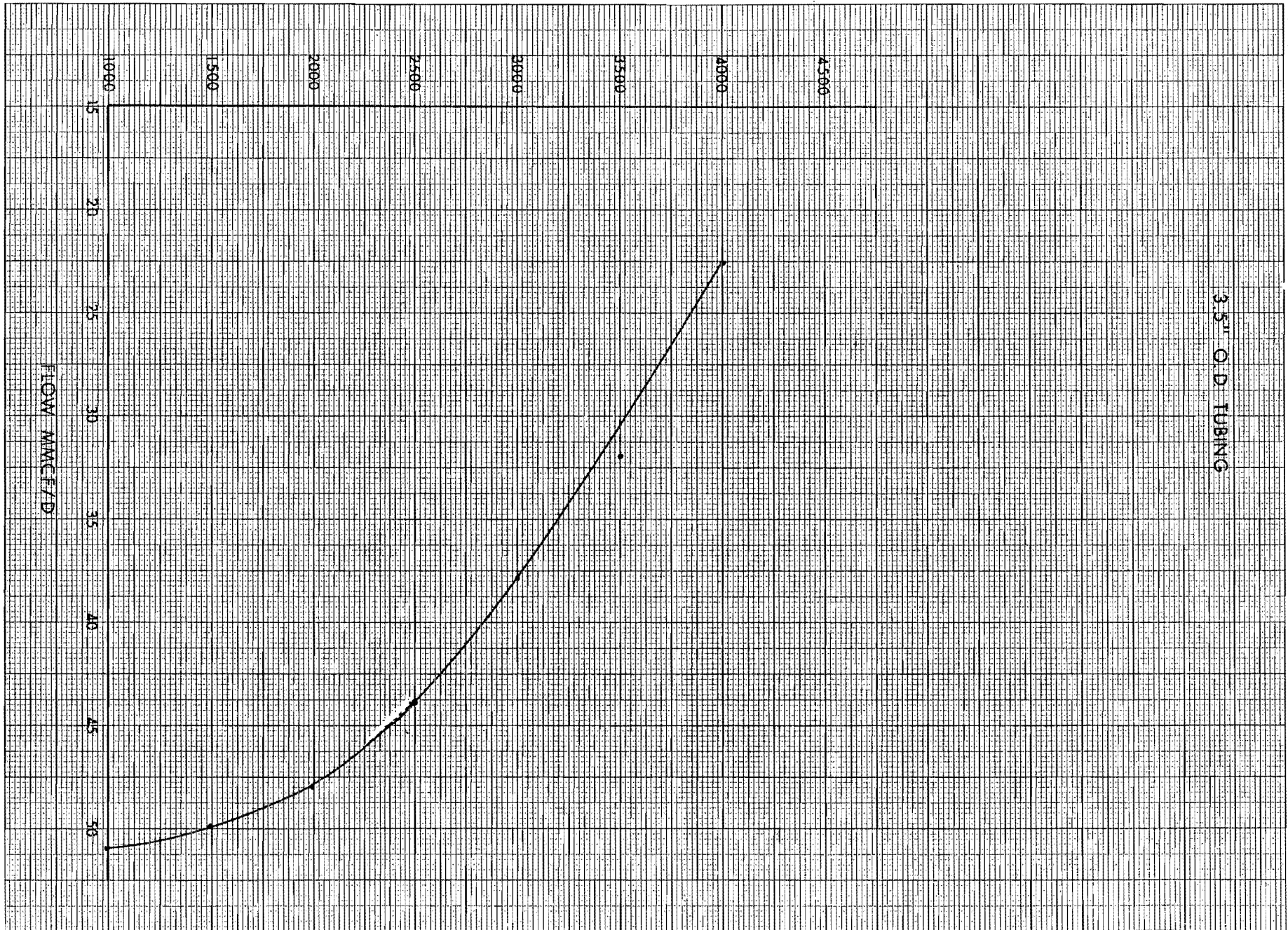


FLOW (MMCFD)

WELLHEAD PRESSURE - PSIA

COLUMBIA et al KOTANEELER YT 1-48 WELLHEAD DELIVERABILITY ENGLISH UNITS

3.5" O.D. TUBING





TEST DATA SHEET

WELL No. COLUMBIA ET AL. KOTANEELEE YT I-48

DATE 1980-06-14

SHEET No. 08 JOB No. 4352

HIGH STAGE METER RUN SIZE	<u>6.065</u>	<u>154.050</u>	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/>	H.S. METER SIZE <u>3000</u>	<input checked="" type="checkbox"/>	<u>400.00</u>
ANNULUS	<input type="checkbox"/>	L.S. METER SIZE	<input checked="" type="checkbox"/>	<u>20684</u>
			<input checked="" type="checkbox"/>	<u>99.52</u>

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP. °C	HIGH STAGE SEPARATOR READINGS						LOW STAGE SEPARATOR READINGS						
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF. IN. Pga/kPa	M.R. TEMP. °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d	STATIC PRESS. PSIG Pga/kPa	DIFF. IN. Pga/kPa	M.R. TEMP. °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d		
		IN. PSIG	°F	PSIG	PSIG		DEAD WT. PSIG	METER PSIG											
		mm Pga/kPa	°C	Pga/kPa	Pga/kPa		Pga/kPa	Pga/kPa											
01:00	INCREASED CHOKE? FLOWED WELL ON CLEAN-UP DIRECT TO FLARE STACK.																		
01:00	128/64			1375															
	50.8		30	9480															
02:00			38	7584															
03:00			48	7067															
04:00			51	6895															
05:00			55	7067															
06:00			58	7239															
07:00			60	7412															
08:00			61	7412															
08:30			61	7412															
09:00			61	7412															
			63	7412															
09:25	DECREASED CHOKE.																		
09:25	1.00																		
	25.40																		
10:00				2450															
			67	16892															

REMARKS: ALL TUBING PRESSURES ARE GAUGE READINGS.

TEST DATA SHEET

WELL No. COLUMBIA ET AL. KOTANEELEE YT I-48 DATE 1980-06-14

SHEET No. 09 JOB No. 4352

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x
				99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE
		PSIG	°F	PSIG	PSIG		DEAD WT.	METER									
		IN.	°C	PSIG	PSIG		PSIG	PSIG	PSIG	PSIG	PSIG	°C	mm	10 ³ m ³ /d	PSIG	PSIG	°C
mm	Pga/kPa	°C	Pga/kPa	Pga/kPa	°C	Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	
11:00	CHANGED THERMOMETERS.																
11:00	1.00			2450													
	25.40		75	16892													
12:00				2500													
			75	17237													
12:00	SHUT IN WELL TO REPAIR LEAKS AT WELLHEAD CAP AND																
12:00	WELLHEAD RISER.																
12:02				4700													
				32405													
12:02	SHUT IN MASTER VALVES; BY THE TIME WING VALVE WAS																
12:02	CLOSED, PRESSURE HAD REACHED 4700 PSIG.																
14:25	PRESSURED UP TO CHOKE.																
14:25				4640													
				31991													
14:30	OPENED WELL DIRECT TO FLARE STACK ON CLEAN-UP.																
14:30	1.00			4640													
	25.40			31991													
15:00				2525													
			60	17409													
16:00				2550													
			70	17581													
17:00				2550													
			77	17581													

REMARKS:

TEST DATA SHEET

WELL No. COLUMBIA ET AL. KOTANEELEE YT I-48

DATE 1980-06-14

SHEET No. 10 JOB No. 4357

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/>	H.S. METER SIZE	3000	X
ANNULUS	<input type="checkbox"/>	L.S. METER SIZE		X
			400.00	X
			20684	X
				99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE
		IN.	°F	PSIG	PSIG		DEAD WT.	METER	IN.	°F	IN.	MMCF/D	PSIG	IN.	°F	IN.	MMCF/D
		mm	°C	Pga/kPa	Pga/kPa		Pga/kPa	Pga/kPa	Pga/kPa	°C	Pga/kPa	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm
18:00	1.00			2575													
	25.40		80	17754													
19:00			82	17754													
20:00			85	17754													
21:00			85	17754													
22:00			87	17754													
23:00			87	17754													
24:00			87	17754													
24:00	SHUT	IN WELL. NO BUILD UPS RECORDED.															

REMARKS: NOTE # CREW MOVED TO LOCATION E-37, JOB #4357.

TEST DATA SHEET

WELL No. COLUMBIA ET AL. NOTANEELEE YT I-48 DATE 1980-06-18

SHEET No. 11 JOB No. 4352

HIGH STAGE METER RUN SIZE	<u>6.065</u>	<u>154.050</u>	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	<u>3000</u>	x	<u>400.00</u>
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	<u>20684</u>
				<u>99.52</u>

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS						LOW STAGE SEPARATOR READINGS				
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE
		IN.	°F	PSIG	PSIG		DEAD WT.	METER									
		mm	°C	Pga/kPa	Pga/kPa		Pga/kPa	Pga/kPa	Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C
00:01		PRESSURED UP TO CHOKE.															
00:01				4350													
				29992													
00:05		SHUT IN WELL AND REPAIRED LEAK.															
00:10		PRESSURED UP TO CHOKE.															
00:10				4350													
				29992													
00:15		SHUT WELL IN AND REPAIRED LEAK.															
00:35		PRESSURED UP TO CHOKE.															
00:35				4350													
				29992													
01:00		OPENED WELL THROUGH SEPARATOR.															
01:00				4350													
				29992													
01:30	48/64			3510													
	19.05	20		24200													
01:45	INCREASED CHOKE & STARTED FREEZING OFF SURFACE EQUIPMENT																
01:45	74/64																
	29.37																
02:00	METER AND WIZARD CONTROLLER FROZE OFF.																
02:00				1875													
		30		12928													

REMARKS:

TEST DATA SHEET

WELL No. COLUMBIA ET AL. KOTANEELEE YT I-48 DATE 1980-06-18

SHEET No. 13 JOB No. 4352

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
			x	99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE
		IN. PSIG	°F	PSIG	PSIG		DEAD WT. PSIG	METER PSIG	IN.	°F	IN.	MMCF/D	PSIG	IN.	°F	IN.	MMCF/D
		mm Pga/kPa	°C	Pga/kPa	Pga/kPa		Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d
05:30		REOPENED WELL THROUGH SEPARATOR.															
05:30	1.00			4511													
	25.40			31102													
05:45		METER INTO SERVICE.															
05:45				2320													
			54	15996													
06:00				2286				1140	80.00						40.200		
			57	15761				7860	19.90	40					132.59		
06:30				2305				1140	80.00								
			65	15892				7860	19.90	50							
07:00				2322				1140	80.00						40.200		
			70	16009				7860	19.90	52					132.59		
07:30				2337				1140	80.00								
			73	16113				7860	19.90	56							
07:40		DECREASED BACK PRESSURE.															
08:00				2347				960	96.00								
			75	16182				6619	23.88	56							
08:20		INCREASED CHOKER/DECREASED BACK PRESSURE.															
08:20	28/64																
	50.8																
08:30				1417				800	164.00								
			71	9770				5516	40.80	58							
09:00				1423				800	164.00						49.700		
			73	9811				5516	40.80	66					400.24		
09:30				1432				807	800	168.00							
			74	9873				5564	5516	41.80	67						

REMARKS:

PORTA-TEST SYSTEMS, LTD.
P.O. BOX 5510 STATION L
EDMONTON, ALBERTA T6C 4E9

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

TEST DATA SHEET

WELL No. COLUMBIA ET AL. KUTANEELEE YT I-48 DATE 1980-06-18

SHEET No. 14 JOB No. 4352

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
			x	99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS							
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE		
							DEAD WT.	METER											
							PSIG	PSIG										IN.	°F
mm	Pga/kPa	°C	Pga/kPa	Pga/kPa	°C	Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d			
10:00				1426				800	168.00				4.500						
10:05	DECREASED	CHOKE.	75	9832				5516	41.80	67	114.30								
10:05	46/64																		
	18.28																		
10:30	INCREASED	CHOKE.																	
10:30	52/64			3561				800	64.00				38.0						
	20.64		79	24552				5516	15.92	45									
11:00				3080				800	96.00										
			80	21236				5516	23.88	50									
11:00	WELL SHUT	IN	END OF CLEAN-UP?	RECORDED	BUILD UPS.														
11:15				4555															
				31405															
11:30				4550															
				31371															
12:55				4510															
				31095															
13:00				4510															
				31095															
13:00	OPENED	WELL	THROUGH	SEPARATOR	FOR	RUN	#1.												
13:15	40/64			3717															
	15.88		62	25628															
13:15	METER	INTO	SERVICE?	CHOKE	SET.														
13:30				3732				1100	40.00										
			63	25731				7584	9.95	28									

REMARKS:

TEST DATA SHEET

WELL No. COLUMBIA ET AL. KOTANEELEE YT I-48

DATE 1980-06-18

SHEET No. 15 JOB No. 4352

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
			x	99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS											
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE						
							DEAD WT.	METER										PSIG	IN.	MMCF/D	PSIG	IN.	MMCF/D
							PSIG	PSIG															
IN.	°F	PSIG	PSIG	°F	°C	°F	°C	mm	10 ³ m ³ /d	PSIG	IN.	°F	IN.	MMCF/D									
mm	Pga/kPa	°C	Pga/kPa	Pga/kPa	°C	Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d							
14:00	40/64			3762			1100	40.00		4.500	30.000												
	15.88		66	25938			7584	9.95	31	14.30	845.22												
14:30			69	2782			1073	1090	40.00														
				26076			7398	7515	9.95	32													
15:00				3795				1090	40.00														
			72	26165				7515	9.95	38													
15:30				3792				1090	40.00														
			74	26145				7515	9.95	40													
16:00				3797				1090	40.00		29.800												
			77	26179				7515	9.95	44	839.58												
16:30				3807				1090	40.00														
			79	26248				7515	9.95	46													
17:00				3807				1090	40.00														
			79	26248				7515	9.95	46													
17:00	WELL SHUT IN	END OF FLOW RATE	#1.																				
17:15	RECORDED BUILD UPS.																						
17:15				4505																			
				31061																			
17:30				4500																			
				31026																			
19:00				4510																			
				31095																			
20:00				4500																			
				31026																			
20:45	PRESSURED TO CHOKE.																						
20:45				4485																			
				30923																			

REMARKS:

TEST DATA SHEET

SHEET No. 17 JOB No. 4352

HIGH STAGE METER RUN SIZE	<u>6.065</u>	<u>154.050</u>	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	<u>3000</u>	<u>400.00</u>	<u>20684</u>
ANNULUS	<input type="checkbox"/> L.S. METER SIZE			<u>99.52</u>

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS						
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	
		IN.	PSIG	°F	PSIG		PSIG	PSIG	PSIG	IN.	°F	IN.	MMCF/D	PSIG	IN.	°F	IN.	MMCF/D
		mm	Pga/kPa	°C	Pga/kPa		Pga/kPa	°F	Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm
00:30	50/64			3215			1080	64.00		4.500								
	19.84			22166			7446	15.92	58	114.30								
01:00				3216			1080	64.00			35.000							
				22173			7446	15.92	59		986.09							
01:00	END OF FLOW RATE #2.																	
01:15	RECORDED BUILD UPS.																	
01:15				4560														
				31440														
01:30				4550														
				31371														
02:00				4533														
				31254														
03:00				4510														
				31095														
04:00				4510														
				31095														
04:55				4430														
				30544														
05:00				4430														
				30544														
05:00	OPENED WELL THROUGH SEPARATOR ON RATE #3.																	
05:15	METER INTO SERVICE. CHOKE SET.																	
05:15	62/64			2376														
	24.61			16382														
05:30				2376			1040	88.00										
				16382			7170	21.89	46									

REMARKS: _____

TEST DATA SHEET

WELL No. COLUMBIA ET AL. KOTANEELEE YT I-48

DATE 1980-06-19

SHEET No. 18 JOB No. 4352

HIGH STAGE METER RUN SIZE	<u>6.065</u>	<u>154.050</u>	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	<u>3000</u>	<u>400.00</u>	<u>20684</u>
ANNULUS	<input type="checkbox"/> L.S. METER SIZE			<u>99.52</u>

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE
		IN.	°F	PSIG	PSIG		DEAD WT.	METER	IN.	°F	IN.	MMCF/D	PSIG	IN.	°F	IN.	MMCF/D
		mm	°C	Pga/kPa	Pga/kPa		Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d
06:00	62/64			2410				1040	88.00		4.500						
	24.61		64	16616				7170	21.89	43	114.30						
06:30			70	2443				1040	92.00								
				16844				7170	22.89	53							
07:00				2463				1048	1040	92.00				43.000			
			75	16982				7226	7170	22.89	55			211.48			
07:30				2476				1040	92.00								
			78	17071				7170	22.89	56							
08:00				2489				1040	92.00								
			80	17161				7170	22.89	59							
08:30				2496				1040	92.00								
			81	17209				7170	22.89	65							
09:00				2501				1040	96.00					43.000			
			84	17244				7170	23.88	67				211.48			
09:00	END OF RATE #3; WELL SHUT IN.																
09:15	RECORDED BUILD UPS.																
09:15				4557													
				31419													
09:30				4550													
				31371													
10:00				4538													
				31288													
10:30				4522													
				31178													
11:00				4503													
				31047													
12:00				4502													
				31040													

REMARKS: CLOCK PROBLEMS THROUGHOUT RUN #3; MOVED CLOCK MANUALLY EVERY 15 MINS. (NO SPARE)

TEST DATA SHEET

SHEET No. 19 JOB No. 4352

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
			x	99.52

TIME	CHOKE SIZE IN. mm	WELLHEAD READINGS				HEATER BATH TEMP. °F °C	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER PSIG Pga/kPa	FLOW TEMP. °F °C	TUBING PRESS. PSIG Pga/kPa	ANNULUS PRESS. PSIG Pga/kPa		STATIC PRESS.		DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d	STATIC PRESS. PSIG Pga/kPa	DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10 ³ m ³ /d
							DEAD WT.	METER									
							PSIG Pga/kPa	PSIG Pga/kPa									
12:55		PRESURED TO CHOKE.															
12:55				4497													
				31005													
13:00		OPENED WELL THROUGH SEPARATOR FOR RUN #4.															
13:00				4497													
				31005													
13:15		METER INTO SERVICE? CHOKE SET.															
13:15	128/64			1382													
	50.8			9528													
13:30				1376													
			54	9487			800	168.00									
14:00				1395			5516	41.80	45								
			61	9618			820	168.00									
14:30				1410			5654	41.80	50								
			69	9722			820	168.00									
15:00				1420			5654	41.80	52								
			72	9790			820	170.00									
15:30				1427			5654	42.30	65								
			75	9839			820	170.00									
16:00				1431			5654	42.30	66								
			76	9866			820	170.00									
16:30				1435			5654	42.30	69								
			78	9894			820	170.00									
17:00				1440			5654	42.30	70								
			78	9928			810	820	170.00								
17:30				1440			5585	5654	42.30	70							
			79	9928			820	170.00									
							5654	42.30	73								

REMARKS: BACK PRESSURE VALVE WIDE OPEN.

TEST DATA SHEET

SHEET No. 20 JOB No. 4352

HIGH STAGE METER RUN SIZE	<u>6.065</u>	<u>154.050</u>	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	<u>3000</u>	<input checked="" type="checkbox"/> 400.00	<u>20684</u>
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		<input checked="" type="checkbox"/>	<u>99.52</u>

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP. °C	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE
		PSIG	°F	PSIG	PSIG		DEAD WT.	METER									
		mm	Pga/kPa	°C	Pga/kPa		Pga/kPa	Pga/kPa	Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C
18:00	128/64			1442			820	174.00			4.500						
	50.8		79	9942			5654	43.29	74	114.30							
18:30			80	9935			820	174.00									
19:00			80	9942			5654	43.29	74		50.000						
19:30			80	9949			820	174.00			1408.70						
20:00			80	9949			5654	43.29	75								
20:30			81	9963			820	174.00									
21:00			82	9984			5654	43.29	75		50.000						
21:30			82	9984			820	174.00			408.70						
22:00			82	9977			5654	43.29	75								
22:30			82	9977			820	174.00									
23:00			83	9970			5654	43.29	76								
23:30			83	9977			820	174.00									
24:00			83	9984			5654	43.29	76		50.000						
							820	174.00			1408.70						

REMARKS:

TEST DATA SHEET

WELL No. COLUMBIA ET AL. KOTANEELEE YT I-48 DATE 1980-06-20

SHEET No. 21 JOB No. 4352

HIGH STAGE METER RUN SIZE	6.065	154.050	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	3000	x	400.00
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		x	20684
				x 99.52

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP. °C	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS						
		FLOW PROVER PSIG Pga/kPa	FLOW TEMP. °C	TUBING PRESS. PSIG Pga/kPa	ANNULUS PRESS. PSIG Pga/kPa		STATIC PRESS.		DIFF. IN. Pga/kPa	M.R. TEMP. °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10³ m³/d	STATIC PRESS. PSIG Pga/kPa	DIFF. IN. Pga/kPa	M.R. TEMP. °C	ORIFICE SIZE IN. mm	FLOW RATE MMCF/D 10³ m³/d	
							DEAD WT. PSIG Pga/kPa	METER PSIG Pga/kPa										
							IN. mm	PSIG Pga/kPa										
00:30	128/64			1448				820	174.00					4.500				
	50.8		83	9984				5654	43.29	76		114.30						
01:00				1447				820	174.00					50.000				
			83	9977				5654	43.29	76				408.70				
01:30				1448				820	174.00									
			83	9984				5654	43.29	76								
02:00				1447				820	174.00									
			83	9977				5654	43.29	76								
02:30				1447				820	174.00									
			83	9977				5654	43.29	76								
03:00				1447				820	174.00									
			83	9977				5654	43.29	76								
03:30				1448				820	174.00									
			83	9984				5654	43.29	76								
04:00				1448				820	174.00									
			83	9984				5654	43.29	76								
04:30				1448				820	174.00									
			83	9984				5654	43.29	76								
05:00				1448				820	174.00									
			83	9984				5654	43.29	76								
05:30				1448				820	174.00									
			83	9984				5654	43.29	76								
06:00				1448				820	174.00									
			83	9984				5654	43.29	76								
06:30				1448				820	174.00									
			83	9984				5654	43.29	76								
07:00				1448				820	174.00					50.000				
			84	9984				5654	43.29	76				408.70				
07:30				1448				820	174.00									
			84	9984				5654	43.29	76								

REMARKS:

TEST DATA SHEET

SHEET No. 22 JOB No. 4352

HIGH STAGE METER RUN SIZE	<u>6.065</u>	<u>154.050</u>	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	<u>3000</u>	<u>400.00</u>	<u>20684</u>
ANNULUS	<input type="checkbox"/> L.S. METER SIZE			<u>99.52</u>

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP. °C	HIGH STAGE SEPARATOR READINGS					LOW STAGE SEPARATOR READINGS					
		FLOW PROVER IN. mm	FLOW TEMP. °F °C	TUBING PRESS. PSIG Pga/kPa	ANNULUS PRESS. PSIG Pga/kPa		STATIC PRESS.		DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCFD 10³ m³/d	STATIC PRESS. PSIG Pga/kPa	DIFF. IN. Pga/kPa	M.R. TEMP. °F °C	ORIFICE SIZE IN. mm	FLOW RATE MMCFD 10³ m³/d
							DEAD WT. PSIG Pga/kPa	METER PSIG Pga/kPa									
08:00	128/64			1448			820	174.00		4.500	50.000						
	50.8		85	9984			5654	43.29	76	14.30	408.70						
08:30			85	9977			820	174.00									
			85	9977			5654	43.29	76								
09:00				1448			820	174.00									
			87	9984			5654	43.29	76								
09:30			86	9977			820	174.00									
			86	9977			5654	43.29	76								
10:00				1446			820	174.00									
			85	9970			5654	43.29	76								
10:30			85	9984			820	174.00									
			85	9984			5654	43.29	76								
11:00				1447			820	174.00									
			85	9977			5654	43.29	76								
11:30			85	9977			820	174.00									
			85	9977			5654	43.29	76								
12:00				1447			820	174.00									
			85	9977			5654	43.29	76								
12:30				1446			820	174.00									
			85	9970			5654	43.29	76								
13:00				1446			820	174.00									
			85	9970			5654	43.29	76			50.000					
13:00	SHUT WELL IN											408.70					
13:05	RECORDED BUILD UPS WHILE RIGGING OUT TEST EQUIPMENT.																
13:05				4570													
				31509													
13:30				4550													
				31371													

REMARKS:

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

TEST DATA SHEET

WELL No. COLUMBIA ET AL KOTANEELEE YT I-48 DATE 1980-06-20

SHEET No. 23 JOB No. 4352

HIGH STAGE METER RUN SIZE	<u>6.065</u>	<u>154.050</u>	LOW STAGE METER RUN SIZE	
FLOWING: TUBING	<input checked="" type="checkbox"/> H.S. METER SIZE	<u>3000</u>	<input checked="" type="checkbox"/> 400.00	<u>20684</u>
ANNULUS	<input type="checkbox"/> L.S. METER SIZE		<input checked="" type="checkbox"/>	<u>99.52</u>

TIME	CHOKE SIZE	WELLHEAD READINGS				HEATER BATH TEMP.	HIGH STAGE SEPARATOR READINGS						LOW STAGE SEPARATOR READINGS				
		FLOW PROVER	FLOW TEMP.	TUBING PRESS.	ANNULUS PRESS.		STATIC PRESS.		DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE	STATIC PRESS.	DIFF.	M.R. TEMP.	ORIFICE SIZE	FLOW RATE
							DEAD WT.	METER									
							PSIG	PSIG									
mm	Pga/kPa	°C	Pga/kPa	Pga/kPa	°C	Pga/kPa	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	Pga/kPa	Pga/kPa	°C	mm	10 ³ m ³ /d	
14:00	RECORDED BUTL			UPS.													
14:00				4550													
				31371													
15:00				4530													
				31233													
20:00				4475													
				30854													
20:00	END OF BUILD			UPS.													

REMARKS:

PORTA-TEST SYSTEMS, LTD.
P.O. BOX 5510 STATION L
EDMONTON, ALBERTA T6C 4E9

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

FLUID PRODUCTION

WELL No. COLUMBIA ET AL. KOTANEELEE YT I-48

DATE 1980-06-18

SHEET No. 03 JOB No. 4352

TIME	TANK NO. 1				TANK NO. 2				TEMP. °F °C	TANK NO. 1				TANK NO. 2			
	CONDENSATE		WATER		PROD.		SHIPPING			CONDENSATE		WATER		PROD.		SHIPPING	
	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER		Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER
	mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.		mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.
00:01			0														
06:00			18.9	31.5		31.5											
			480	5.0		5.0											
08:00			31.5	52.5		21.0											
			800	8.3		3.3											
10:00			42.5	70.8		18.3											
			1080	11.3		3.0											
11:00			52.0	86.7		15.9					9.4	15.7					
			1320	13.8		2.5					240	2.5					
TOTALS						86.7					TOTALS						
						13.8											

REMARKS: CLEAN-UP. 11:00--WELL SHUT
IN? END OF CLEAN-UP RUN.

	TANK # 1				TANK # 2			
	COND.	COND.	WATER	WATER	COND.	COND.	WATER	WATER
OPENING GUAGE	0.0	0.0	0.0	0.0	0.0	0.0	15.7	2.5
PLUS PRODUCTION			86.7	13.8				
TOTALS			86.7	13.8			15.7	2.5
MINUS SHIPPING								
CLOSING GUAGE	0.0	0.0	86.7	13.8	0.0	0.0	15.7	2.5

PORTA-TEST SYSTEMS, LTD.
P.O. BOX 5510 STATION L
EDMONTON, ALBERTA T6C 4E9

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

FLUID PRODUCTION

WELL No. COLUMBIA ET AL KOTANEELEE YT I-48

DATE 1980-06-18

SHEET No. 05 JOB No. 4352

RUN #	TIME ON	TIME OFF	GRAVITY	FLOW RATE
2	21:00			35.00
				986.1

TIME	TANK NO. 1				SIZE				400 BBLs				63 M3				TEMP. °F °C	TANK NO. 2				SIZE				400 BBLs				63 M3					
	CONDENSATE		WATER		PROD.		SHIPPING		CONDENSATE		WATER		PROD.		SHIPPING			CONDENSATE		WATER		PROD.		SHIPPING		CONDENSATE		WATER		PROD.		SHIPPING			
	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER		Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER		
	mm	m ³	mm	m ³	m ³	m ³	m ³	m ³	mm	m ³	mm	m ³	m ³	m ³	m ³	m ³		m ³	m ³	mm	m ³	mm	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³	m ³			
21:00			68.5	114.2																9.4	15.7														
			1740	18.1																240	2.5														
23:00																				17.3	28.8			13.1											
																				440	4.6			2.1											
24:00			68.5	114.2																20.5	34.2			5.4											
			1740	18.1																520	5.4			.8											
TOTALS										TOTALS																									

REMARKS:

	TANK # 1				TANK # 2			
	COND.	COND.	WATER	WATER	COND.	COND.	WATER	WATER
OPENING GUAGE	0.0	0.0	114.2	18.1	0.0	0.0	15.7	2.5
PLUS PRODUCTION							18.5	2.9
TOTALS			114.2	18.1			34.2	5.4
MINUS SHIPPING								
CLOSING GUAGE	0.0	0.0	114.2	18.1	0.0	0.0	34.2	5.4

PORTA-TEST SYSTEMS, LTD.
P.O. BOX 5510 STATION L
EDMONTON, ALBERTA T6C 4E9

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

FLUID PRODUCTION

WELL No. COLUMBIA ET AL KOTANEELEE YT 1-48

DATE 1980-06-19

SHEET No. 06 JOB No. 4352

TIME	TANK NO. 1				TANK NO. 2				TEMP. °F °C	TANK NO. 1				TANK NO. 2			
	CONDENSATE		WATER		PROD.		SHIPPING			CONDENSATE		WATER		PROD.		SHIPPING	
	Ins. mm	Bbls. m ³	Ins. mm	Bbls. m ³	COND. Bbls. m ³	WATER Bbls. m ³	COND. Bbls. m ³	WATER Bbls. m ³		Ins. mm	Bbls. m ³	Ins. mm	Bbls. m ³	COND. Bbls. m ³	WATER Bbls. m ³	COND. Bbls. m ³	WATER Bbls. m ³
00:01			68.5	114.2							20.5	34.2					
			1740	18.1							520	5.4					
01:00			68.5	114.2							25.2	42.0		7.8			
			1740	18.1							640	6.7		1.3			
			TOTALS									TOTALS		7.8			
														1.3			

REMARKS:

	TANK # 1				TANK # 2			
	COND.	COND.	WATER	WATER	COND.	COND.	WATER	WATER
OPENING GUAGE	0.0	0.0	114.2	18.1	0.0	0.0	34.2	5.4
PLUS PRODUCTION							7.8	1.3
TOTALS			114.2	18.1			42.0	6.7
MINUS SHIPPING								
CLOSING GUAGE	0.0	0.0	114.2	18.1	0.0	0.0	42.0	6.7

PORTA-TEST SYSTEMS, LTD.
P.O. BOX 5510 STATION L
EDMONTON, ALBERTA T6C 4E9

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

FLUID PRODUCTION

WELL No. COLUMBIA ET AL. KOTANEELEE YT I-48

DATE 1980-06-19

SHEET No. 07 JOB No. 4352

TIME	TANK NO. 1				TANK NO. 2				TEMP. °F °C	TANK NO. 1				TANK NO. 2			
	CONDENSATE		WATER		PROD.		SHIPPING			CONDENSATE		WATER		PROD.		SHIPPING	
	Ins. mm	Bbls. m³	Ins. mm	Bbls. m³	COND. Bbls. m³	WATER Bbls. m³	COND. Bbls. m³	WATER Bbls. m³		Ins. mm	Bbls. m³	Ins. mm	Bbls. m³	COND. Bbls. m³	WATER Bbls. m³	COND. Bbls. m³	WATER Bbls. m³
05:00			68.5	114.2							25.2	42.0					
			1740	18.1							640	6.7					
07:00											26.8	44.7		2.7			
											680	7.1		.4			
09:00			5.5	9.2				105.0			49.6	82.7		38.0			
			140	1.5				16.6			1260	13.1		6.0			
TOTALS								105.0		TOTALS					40.7		
								16.6							6.4		

REMARKS:

	TANK # 1				TANK # 2			
	COND.	COND.	WATER	WATER	COND.	COND.	WATER	WATER
OPENING GUAGE	0.0	0.0	114.2	18.1	0.0	0.0	42.0	6.7
PLUS PRODUCTION							40.7	6.4
TOTALS			114.2	18.1			82.7	13.1
MINUS SHIPPING			105.0	16.6				
CLOSING GUAGE	0.0	0.0	9.2	1.5	0.0	0.0	82.7	13.1

PORTA-TEST SYSTEMS, LTD.
P.O. BOX 5510 STATION L
EDMONTON, ALBERTA T6C 4E9

COMPANY COLUMBIA GAS DEVELOPMENT OF CANADA LTD.

FLUID PRODUCTION

WELL No. COLUMBIA ET AL. KOTANEELEE YT I-48

DATE 1980-06-19

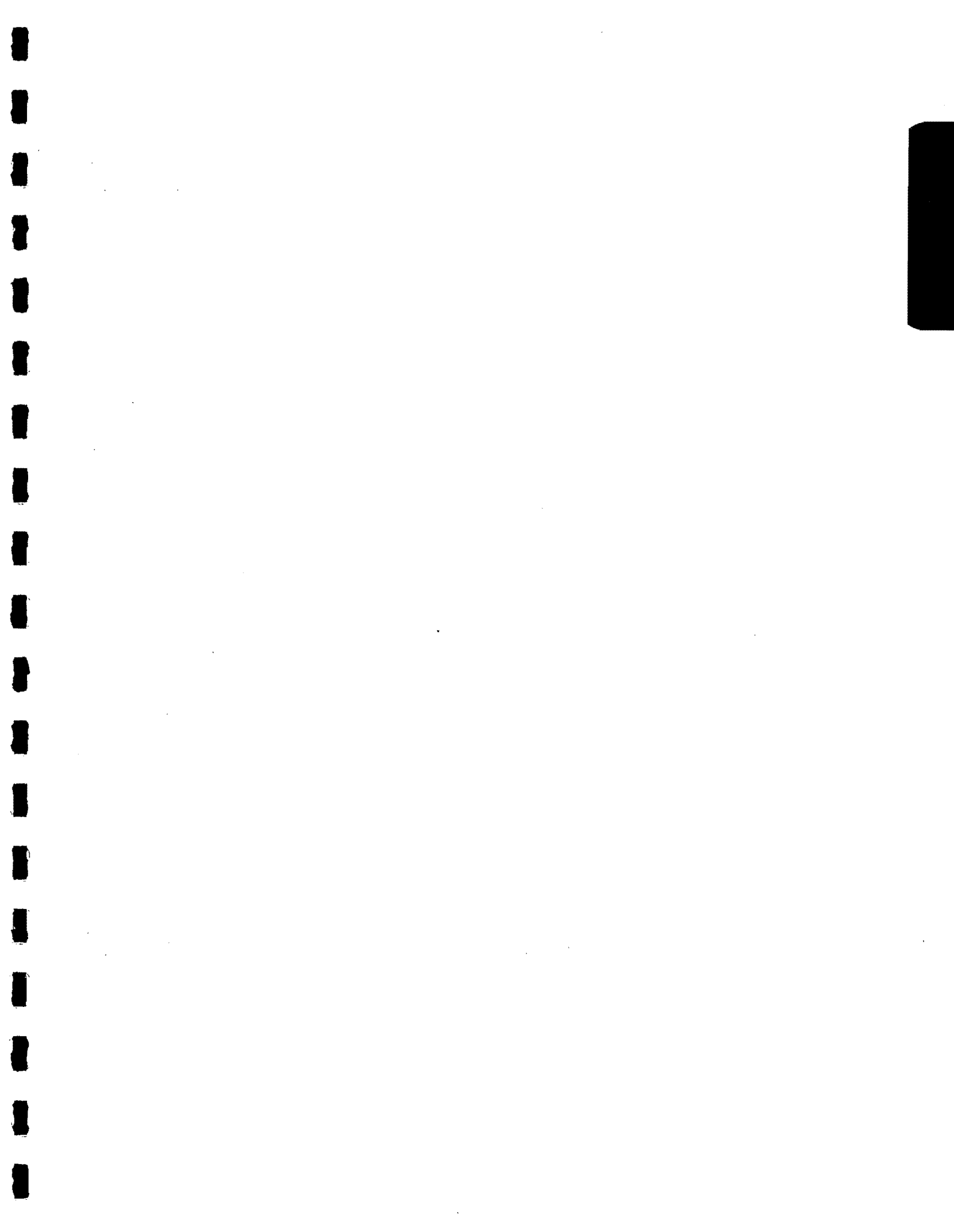
SHEET No. 08 JOB No. 4352

RUN #	TIME ON	TIME OFF	GRAVITY	FLOW RATE
4	13:00			50.00
				1408.7

TIME	TANK NO. 1				SIZE				400 BBLs				63 M3				TEMP. °F °C	TANK NO. 2				SIZE				400 BBLs				63 M3			
	CONDENSATE		WATER		PROD.		SHIPPING		CONDENSATE		WATER		PROD.		SHIPPING			CONDENSATE		WATER		PROD.		SHIPPING									
	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER	Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER		Ins.	Bbls.	Ins.	Bbls.	COND.	WATER	COND.	WATER								
	mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.	mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.		mm	m ³	mm	m ³	Bbls.	Bbls.	Bbls.	Bbls.								
13:00			5.5	9.2															49.6	82.7													
			140	1.5															1260	13.1													
15:00			24.4	40.7			31.5																										
			620	6.5			5.0																										
17:00			37.0	61.7			21.0																										
			940	9.8			3.3																										
19:00			42.5	70.8			9.1																										
			1080	11.3			1.5																										
21:00			52.8	88.0			17.2																										
			1340	14.0			2.7																										
23:00			73.2	122.0			34.0																										
			1860	19.4			5.4																										
24:00			78.7	131.2			9.2												49.6	82.7													
			2000	20.8			1.4												1260	13.1													
TOTALS						122.0			TOTALS																								
						19.3																											

REMARKS: 13:00-OPENED WELL ON RUN #4 AND EXTENDED RATE.

	TANK # 1				TANK # 2			
	COND.	COND.	WATER	WATER	COND.	COND.	WATER	WATER
OPENING GAUGE	0.0	0.0	9.2	1.5	0.0	0.0	82.7	13.1
PLUS PRODUCTION			122.0	19.3				
TOTALS			131.2	20.8			82.7	13.1
MINUS SHIPPING								
CLOSING GAUGE	0.0	0.0	131.2	20.8	0.0	0.0	82.7	13.1



BONNETT'S WIRELINE SERVICE LTD.

Subsurface Pressure Measurements - Static Test

BOX 6151, FORT ST. JOHN, B.C. V1J 4H7

PHONE 785-2178

1. BASIC WELL DATA

PAGE 1 OF 6

COMPANY <u>Columbia Gas Development</u>	WELL NAME <u>Columbia et al Kotaneelee</u>
ADDRESS <u>1000, 639-5 Ave., S.W. Calgary</u>	LOCATION <u>YT-I-48</u>
POOL <u>Nahanni</u>	DATE OF TEST <u>80/06/17</u>
SHUT-IN DATE & TIME _____	SHUT-IN PERIOD _____
SAFE RUNNING DEPTH (FROM CF) _____ m	PERFORATED <input checked="" type="checkbox"/> OPEN HOLE <input type="checkbox"/>
ELEVATION: CASING FLANGE (CF) <u>826.89</u> m	(FROM KB) <u>3654.0</u> m TO <u>3840.0</u> m
KELLY BUSHING (KB) <u>834.95</u> m	STATUS: OIL <input type="checkbox"/> GAS <input checked="" type="checkbox"/> OTHER: SPECIFY _____
POOL DATUM _____ m (SUBSEA)	MID-POINT OF PERFORATIONS (FROM CF) <u>3738.9</u> m
KB TO <u>CF-8.06</u> m	DATUM DEPTH OF WELL (FROM CF) _____ m

2. GAUGE AND WELL DATA

SURVEY TYPE: FLOWING <input type="checkbox"/> STATIC <input checked="" type="checkbox"/>	GRADIENT BUILD UP <input checked="" type="checkbox"/>
ELEMENT SERIAL No. <u>39333N</u> RANGE <u>0-82700</u> kPa	CLOCK RGE. <u>180</u> HRS. SK. D. # _____ IH. # _____
CALIBRATION EQUATION <u>1661.17D+(16.62)</u>	DATE OF LATEST CALIBRATION <u>80/06/23</u>
TUBING PRESSURE _____ GAUGE _____ DWG. <u>300000*</u> kPa	CASING PRESSURE _____ GAUGE _____ DWG. _____ kPa
RUN DEPTH (FROM CF) <u>3628.9</u> m	ON BTM. <u>06/17/1930</u> OFF BTM. <u>06/21/2007</u>
TEMPERATURE AT RUN DEPTH _____ °C	ESTIMATED LIQUID LEVEL (FROM CF) <u>NIL</u> m
GRADIENT AT RUN DEPTH _____ kPa/m	PRESSURE AT MID-POINT OF PERFORATIONS _____ kPa
PRESSURE AT RUN DEPTH <u>38677 (F.S.I.P.)</u> kPa	DATUM DEPTH PRESSURE _____ kPa

3. ACOUSTICAL WELL SOUNDER DATA

AVERAGE TUBING JOINT LENGTH _____ m	No. OF TUBING JOINTS TO LIQUID _____
LENGTH OF GAS COLUMN _____ m	GAS GRAVITY _____ OR AVERAGE GRADIENT _____ kPa/m
GAS COLUMN PRESSURE _____ kPa	CASING PRESSURE _____ kPa
PUMP SHOE DEPTH (FROM CF) _____ m	LENGTH OF LIQUID COLUMN _____ m
CURRENT WATER CUT _____ % WATER GRADIENT _____ kPa/m	OIL GRAVITY _____ OIL GRADIENT _____ kPa/m
LIQUID COLUMN PRESSURE _____ kPa	DATUM DEPTH PRESSURE _____ kPa

4. CHART READINGS AND CALCULATIONS

DATE	DEPTH BELOW CF m	TIME	DEFLECTION in mm	CALCULATED PRESSURE kPa	CORRECTION P ± PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
80/06/17	3623.9	1930	RECORDERS ON		BOTTOM		
80/06/17	3623.9	1930	23.46	38988	+5	38993	
		2000	23.45	38971	+5	38976	
		2100	23.44	38954	+5	38959	
		2200	23.44	38954	+5	38959	
		2300	23.44	38954	+5	38959	
80/06/17	3628.9	2400	23.44	38954	+5	38959	
80/06/18	3628.9	0100	23.44	38954	+5	38959	
80/06/18	3628.9	0100	WELL OPENED FOR		CLEAN UP		
80/06/18	3628.9	0115	23.39	38871	+5	38876	
		0130	23.37	38838	+5	38843	
80/06/18	3628.9	0200	23.34	38788	+5	38793	

5. FLOW RATE DATA

ATTACHED

SEE REMARKS

NOT AVAILABLE

NOT REQUIRED

REMARKS -Bottom Recorder

-The top recorder clock malfunctioned.

*Tubing pressure 30420 kPa when recorders pulled, June 21, 1980

SURVEY COMPANY BONNETT'S TEST BY D.B. COMPUTED BY H. Young CHECK BY G.M.

BONNETT'S WIRELINE SERVICE LTD.

BOX 191, GRANDE PRAIRIE, ALTA. T8V 3A4
BOX 6131, FORT ST. JOHN, B.C. V1J 4H7

PHONE 532-8288
PHONE 785-2178

POOL Nahanni WELL NAME Columbia et al Kotaneelee
DATE OF TEST 80/06/17 LOCATION YT-1-48 PAGE 2 OF 6

CHART READINGS AND CALCULATIONS

DATE	DEPTH BELOW CF. m	TIME	DEFLECTION in/mm	CALCULATED PRESSURE kPa	CORRECTION P ± PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
80/06/18	3628.9	0230	23.29	38705	+5	38710	
80/06/18	3628.9	0230	WELL SHUT IN				
80/06/18	3628.9	0245	23.46	38988	+5	38993	
		0300	23.46	38988	+5	38993	
80/06/18	3628.9	0400	23.46	38988	+5	38993	
80/06/18	3628.9	0400	WELL OPENED FOR CLEAN-UP				
80/06/18	3628.9	0415	23.37	38838	+5	38843	
		0430	23.32	38755	+5	38760	
		0500	23.31	38738	+5	38743	
80/06/18	3628.9	0525	23.31	38738	+5	38743	
80/06/18	3628.9	0525	WELL SHUT IN				
80/06/18	3628.9	0530	23.45	38971	+5	38976	
80/06/18	3628.9	0530	WELL OPENED ON 64/64" CHOKE				
80/06/18	3628.9	0545	23.34	38788	+5	38793	
		0600	23.33	38772	+5	38777	
		0630	23.32	38759	+5	38764	
		0700	23.31	38738	+5	38743	
		0730	23.31	38738	+5	38743	
80/06/18	3628.9	0800	23.31	38738	+5	38743	
80/06/18	3628.9	0800	CHOKE INCREASED				
80/06/18	3628.9	0820	23.30	38722	+5	38727	
80/06/18	3628.9	0820	CHOKE SET @ 128/64"				
80/06/18	3628.9	0830	23.29	38705	+5	38710	
		0900	23.28	38689	+5	38694	
		0930	23.28	38689	+5	38694	
80/06/18	3628.9	1000	23.28	38689	+5	38694	
80/06/18	3628.9	1000	CHOKE SET @ 42/64"				
80/06/18	3628.9	1030	23.31	38738	+5	38743	
80/06/18	3628.9	1100	23.31	38738	+5	38743	

5. FLOW RATE DATA - ATTACHED SEE REMARKS NOT AVAILABLE NOT REQUIRED

REMARKS _____

SURVEY COMPANY BONNETT'S TEST BY D.B. COMPUTED BY H. Young CHECK BY G.M.

BONNETT'S WIRELINE SERVICE LTD.

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POOL Nahanni WELL NAME Columbia et al Kotaneelee
DATE OF TEST 80/06/17 LOCATION YT-I-48 PAGE 3 OF 6

CHART READINGS AND CALCULATIONS

DATE	DEPTH BELOW CF. m	TIME	DEFLECTION in/mm	CALCULATED PRESSURE kPa	CORRECTION P ± PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
80/06/18	3628.9	1100	WELL SHUT IN				
80/06/18	3628.9	1105	23.39	38871	+5	38876	
		1110	23.41	38905	+5	38910	
		1115	23.42	38921	+5	38926	
		1130	23.43	38938	+5	38943	
		1200	23.43	38938	+5	38943	
80/06/18	3628.9	1300	23.43	38938	+5	38943	
80/06/18	3628.9	1300	WELL OPENED TO FLOW RATE #1				
80/06/18	3628.9	1315	23.38	38855	+5	38860	
		1330	23.37	38838	+5	38843	
		1400	23.37	38838	+5	38843	
		1500	23.37	38838	+5	38843	
		1600	23.36	38822	+5	38827	
80/06/18	3628.9	1700	23.36	38822	+5	38827	
80/06/18	3628.9	1700	WELL SHUT IN				
80/06/18	3628.9	1705	23.40	38888	+5	38893	
		1710	23.42	38921	+5	38926	
		1715	23.42	38921	+5	38926	
		1730	23.42	38921	+5	38926	
		1800	23.42	38921	+5	38926	
		1900	23.42	38921	+5	38926	
		2000	23.42	38921	+5	38926	
80/06/18	3628.9	2100	23.42	38921	+5	38926	
80/06/18	3628.9	2100	WELL OPENED TO FLOW RATE #2				
80/06/18	3628.9	2115	23.32	38755	+5	38760	
		2130	23.31	38738	+5	38743	
		2200	23.31	38738	+5	38743	
		2300	23.30	38722	+5	38727	
80/06/18	3628.9	2400	23.30	38722	+5	38727	
80/06/19	3628.9	0100	23.30	38722	+5	38727	
80/06/19	3628.9	0100	WELL SHUT IN				
80/06/19	3628.9	0105	23.38	38855	+5	38860	
		0110	23.40	38888	+5	38893	
		0115	23.40	38888	+5	38893	
90/06/19	3628.9	0130	23.40	38888	+5	38893	

5. FLOW RATE DATA - ATTACHED SEE REMARKS NOT AVAILABLE NOT REQUIRED

REMARKS: _____

SURVEY COMPANY BONNETT'S TEST BY D.B. COMPUTED BY H. Young CHECK BY G.M.

BONNETT'S WIRELINE SERVICE LTD.

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POOL Nahanni WELL NAME Columbia et al Kotaneelee
DATE OF TEST 80/06/17 LOCATION YT-1-48 PAGE 4 OF 6

CHART READINGS AND CALCULATIONS

DATE	DEPTH BELOW CF. m	TIME	DEFLECTION in/mm	CALCULATED PRESSURE kPa	CORRECTION P ± PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
80/06/19	3628.9	0200	23.40	38888	+5	38893	
		0300	23.40	38888	+5	38893	
		0400	23.40	38888	+5	38893	
80/06/19	3628.9	0500	23.40	38888	+5	38893	
80/06/19	3628.9	0500	WELL OPENED TO FLOW RATE #3				
80/06/19	3628.9	0515	23.28	38689	+5	38694	
		0530	23.27	38672	+5	38677	
		0600	23.27	38672	+5	38677	
		0700	23.26	38655	+5	38660	
80/06/19	3628.9	0800	23.26	38655	+5	38660	
80/06/19	3628.9	0900	WELL SHUT IN				
80/06/19	3628.9	0905	23.35	38805	+5	38810	
		0910	23.37	38838	+5	38843	
		0915	23.38	38855	+5	38860	
		0930	23.38	38855	+5	38860	
		1000	23.38	38855	+5	38860	
		1100	23.38	38855	+5	38860	
		1200	23.38	38855	+5	38860	
80/06/19	3628.9	1300	23.38	38855	+5	38860	
80/06/19	3628.9	1300	WELL OPENED TO EXTEND FLOW				
80/06/19	3628.9	1315	23.25	38639	+5	38643	
		1330	23.24	38622	+5	38627	
		1400	23.23	38606	+5	38611	
		1500	23.23	38606	+5	38611	
		1500	23.22	38589	+5	38594	
		2000	23.20	38556	+5	38561	
		80/06/19	3628.9	2400	23.18	38523	+5
80/06/20	3628.9	0400	23.17	38506	+5	38511	
		0800	23.15	38473	+5	38478	
80/06/20	3628.9	1300	23.13	38439	+5	38444	
80/06/20	3628.9	1300	WELL SHUT IN FOR FINAL BUILD				
80/06/20	3628.9	1305	23.26	38655	+5	38660	
		1310	23.28	38689	+5	38694	
		1315	23.28	38689	+5	38694	
80/06/20	3628.9	1330	23.29	38689	+5	38694	

5. FLOW RATE DATA - ATTACHED SEE REMARKS NOT AVAILABLE NOT REQUIRED

REMARKS: _____

SURVEY COMPANY BONNETT'S TEST BY D.B. COMPUTED BY H.Young CHECK BY G.M.

BONNETT'S WIRELINE SERVICE LTD.

Subsurface Pressure Measurements - Static Test

BOX 6151, FORT ST. JOHN, B.C. V1J 4H7

PHONE 785-2178

Page 6 of 6

COMPANY <u>Columbia Gas Development(Canada)</u>	WELL NAME <u>Columbia et al Kotaneelee</u>
ADDRESS <u>1000, 639-5 Ave., S.W., Calgary</u>	LOCATION <u>YT-I-48</u>
FIELD and POOL <u>Kotaneelee- Nahanni</u>	STATUS: OIL _____ GAS <input checked="" type="checkbox"/> OTHER: SPECIFY _____
TYPE OF TEST <u>Static Gradient</u>	DATE OF TEST <u>80/06/22</u>
PERF./OPEN HOLE INTERVAL(CF) <u>3645.9-3831.9</u> m	PRODUCING THROUGH: _____ X _____ TUBING _____ CASING _____
ELEVATION(CF) <u>826.89</u> (KB) <u>834.95</u> m	MID-POINT OF PRODUCING INTERVAL (CF) _____ m
POOL DATUM _____ m (SUBSEA)	DATUM DEPTH OF WELL (FROM CF) _____ m

TUBING PRESS <u>30420</u> GAUGE _____ CASING PRESS. _____ (DWG) _____	SHUT-IN TIME _____ hrs.
RUN DEPTH (FROM CF) TOP <u>3627.1</u> BOT. <u>3628.9</u> m	ON BOTTOM-OFF BOTTOM <u>1148-1158</u>
TEMPERATURE AT RUN DEPTH _____ °C	SURFACE TEMPERATURE _____ °C
PRESSURE AT RUN DEPTH TOP <u>39965</u> BOT. <u>39870</u> kPa	PRESSURE AT MID POINT OF PERFORATIONS _____ kPa
<u>Gradient @ run depth top 1.771 bottom 1.731</u> kPa/m	
ELEMENT SERIAL No. <u>18468N</u> RANGE <u>58300</u> kPa	CLOCK RANGE <u>3</u> hours S. <input checked="" type="checkbox"/> D. _____ IH _____
CALIBRATION EQUATION <u>1153.8D + (-34.7)</u>	DATE OF LATEST CALIBRATION <u>80/06/12</u>

TOP RECORDER	DEPTH BELOW CF m	TIME	DEFLECTION in/mm	CALCULATED PRESSURE kPa	CORRECTION P + PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
<u>80/06/22</u>	<u>FLEX ON</u>	<u>1033-36</u>	<u>26.14</u>	<u>30126</u>	<u>-32</u>	<u>30094</u>	
	<u>FLEX OFF</u>	<u>1036-39</u>					
	<u>0</u>	<u>1039-42</u>	<u>26.14</u>	<u>30126</u>	<u>-32</u>	<u>30094</u>	
	<u>303.0</u>	<u>1045-48</u>	<u>26.90</u>	<u>31003</u>	<u>-42</u>	<u>30961</u>	<u>2.844</u>
	<u>607.8</u>	<u>1051-54</u>	<u>27.65</u>	<u>31868</u>	<u>-42</u>	<u>31824</u>	<u>2.831</u>
	<u>912.6</u>	<u>1057-1100</u>	<u>28.39</u>	<u>32722</u>	<u>-42</u>	<u>32680</u>	<u>2.808</u>
	<u>1217.4</u>	<u>1102-05</u>	<u>29.11</u>	<u>33552</u>	<u>-42</u>	<u>33510</u>	<u>2.723</u>
	<u>1522.2</u>	<u>1107-10</u>	<u>29.79</u>	<u>34337</u>	<u>-42</u>	<u>34295</u>	<u>2.575</u>
	<u>1827.0</u>	<u>1112-15</u>	<u>30.46</u>	<u>35110</u>	<u>-49</u>	<u>35061</u>	<u>2.513</u>
	<u>2131.8</u>	<u>1118-21</u>	<u>31.09</u>	<u>35837</u>	<u>-49</u>	<u>35788</u>	<u>2.385</u>
	<u>2436.6</u>	<u>1124-27</u>	<u>31.71</u>	<u>36552</u>	<u>-49</u>	<u>36503</u>	<u>2.346</u>
	<u>2741.4</u>	<u>1130-33</u>	<u>32.31</u>	<u>37245</u>	<u>-49</u>	<u>37196</u>	<u>2.274</u>
	<u>3046.2</u>	<u>1136-39</u>	<u>32.88</u>	<u>37902</u>	<u>-49</u>	<u>37853</u>	<u>2.156</u>
	<u>3351.0</u>	<u>1142-45</u>	<u>33.42</u>	<u>38525</u>	<u>-49</u>	<u>38476</u>	<u>2.044</u>
	<u>3627.1</u>	<u>1148-58</u>	<u>33.84</u>	<u>39010</u>	<u>-45</u>	<u>38965</u>	<u>1.771</u>

ELEMENT SERIAL NO. <u>18469N</u> RANGE <u>58600</u> kPa	CLOCK RANGE <u>3</u> hours S. <input checked="" type="checkbox"/> D. _____ IH _____
CALIBRATION EQUATION <u>1156.9 D + (-30.8)</u>	DATE OF LATEST CALIBRATION <u>80/06/12</u>

BOTTOM RECORDER	DEPTH BELOW CF m	TIME	DEFLECTION in/mm	CALCULATED PRESSURE kPa	CORRECTION P + PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
<u>80/06/22</u>	<u>FLEX ON</u>	<u>1033-36</u>	<u>26.01</u>	<u>30060</u>	<u>-34</u>	<u>30026</u>	
	<u>FLEX OFF</u>	<u>1036-39</u>					
	<u>0</u>	<u>1039-42</u>	<u>26.02</u>	<u>30072</u>	<u>-34</u>	<u>30038</u>	
	<u>304.8</u>	<u>1045-48</u>	<u>26.76</u>	<u>30928</u>	<u>-37</u>	<u>30891</u>	<u>2.799</u>
	<u>609.6</u>	<u>1051-54</u>	<u>27.51</u>	<u>31796</u>	<u>-37</u>	<u>31759</u>	<u>2.848</u>
	<u>914.4</u>	<u>1057-1100</u>	<u>28.26</u>	<u>32663</u>	<u>-37</u>	<u>32626</u>	<u>2.844</u>
	<u>1219.2</u>	<u>1102-05</u>	<u>28.99</u>	<u>33508</u>	<u>-37</u>	<u>33471</u>	<u>2.772</u>
	<u>1524.0</u>	<u>1107-10</u>	<u>29.67</u>	<u>34294</u>	<u>-37</u>	<u>34257</u>	<u>2.579</u>
	<u>1828.8</u>	<u>1112-15</u>	<u>30.33</u>	<u>35058</u>	<u>-33</u>	<u>35025</u>	<u>2.520</u>
	<u>2133.6</u>	<u>1118-21</u>	<u>30.95</u>	<u>35775</u>	<u>-33</u>	<u>35742</u>	<u>2.352</u>
	<u>2438.4</u>	<u>1124-27</u>	<u>31.56</u>	<u>36481</u>	<u>-33</u>	<u>36448</u>	<u>2.316</u>
	<u>2743.2</u>	<u>1130-33</u>	<u>32.15</u>	<u>37164</u>	<u>-33</u>	<u>37131</u>	<u>2.241</u>
	<u>3048.0</u>	<u>1136-39</u>	<u>32.69</u>	<u>37788</u>	<u>-33</u>	<u>37755</u>	<u>2.047</u>
	<u>3352.8</u>	<u>1142-45</u>	<u>33.24</u>	<u>38425</u>	<u>-33</u>	<u>38392</u>	<u>2.090</u>
	<u>3628.9</u>	<u>1148-58</u>	<u>33.65</u>	<u>38899</u>	<u>-29</u>	<u>38870</u>	<u>1.731</u>

REMARKS -NO FLUID LEVEL

SURVEY COMPANY BONNETT'S TEST BY D.B. COMPUTED BY H. Young CHECKED BY G.M.

BONNETT'S WIRELINE SERVICE LTD.

Subsurface Pressure Measurements - Static Test
 BOX 6151, FORT ST. JOHN, B.C. V1J 4H7 PHONE 785-2178

1. BASIC WELL DATA

PAGE 1 OF 6

COMPANY <u>Columbia Gas Development</u>	WELL NAME <u>Columbia et al Kotaneelee</u>
ADDRESS <u>1000, 639-5 Ave., S.W. Calgary</u>	LOCATION <u>YT-1-48</u>
POOL <u>Nahanni</u>	DATE OF TEST <u>80/06/17</u>
SHUT-IN DATE & TIME _____	SHUT-IN PERIOD _____
SAFE RUNNING DEPTH (FROM CF) _____ m	PERFORATED <input checked="" type="checkbox"/> OPEN HOLE <input type="checkbox"/>
ELEVATION: CASING FLANGE (CF) <u>826.89</u> m	(FROM KB) <u>3654.0</u> m TO <u>3840.0</u> m
KELLY BUSHING (KB) <u>834.95</u> m	STATUS: OIL <input type="checkbox"/> GAS <input checked="" type="checkbox"/> OTHER: SPECIFY _____
POOL DATUM _____ m (SUBSEA)	MID-POINT OF PERFORATIONS (FROM CF) <u>3738.9</u> m
KB. TO <u>CF-8.06</u> m	DATUM DEPTH OF WELL (FROM CF) _____ m

2. GAUGE AND WELL DATA

SURVEY TYPE: FLOWING <input type="checkbox"/> STATIC <input type="checkbox"/>	GRADIENT <input type="checkbox"/> BUILD UP <input checked="" type="checkbox"/>
ELEMENT SERIAL No. <u>39333N</u> RANGE <u>0-82700</u> kPa	CLOCK RGE. <u>180</u> HRS. & ID: # _____ IH. # _____
CALIBRATION EQUATION <u>1661.170 + (16.62)</u>	DATE OF LATEST CALIBRATION <u>80/06/23</u>
TUBING PRESSURE _____ GAUGE _____ DWG. <u>30000*</u> kPa	CASING PRESSURE _____ GAUGE _____ DWG. _____ kPa
RUN DEPTH (FROM CF) <u>3628.9</u> m	ON BTM. <u>06/17/1930</u> OFF BTM. <u>06/21/2007</u>
TEMPERATURE AT RUN DEPTH _____ °C	ESTIMATED LIQUID LEVEL (FROM CF) <u>NIL</u> m
GRADIENT AT RUN DEPTH _____ kPa/m	PRESSURE AT MID-POINT OF PERFORATIONS _____ kPa
PRESSURE AT RUN DEPTH <u>38677 (F.S.I.P.)</u> kPa	DATUM DEPTH PRESSURE _____ kPa

3. ACOUSTICAL WELL SOUNDER DATA

AVERAGE TUBING JOINT LENGTH _____ m	No. OF TUBING JOINTS TO LIQUID _____
LENGTH OF GAS COLUMN _____ m	GAS GRAVITY _____ OR AVERAGE GRADIENT _____ kPa/m
GAS COLUMN PRESSURE _____ kPa	CASING PRESSURE _____ kPa
PUMP SHOE DEPTH (FROM CF) _____ m	LENGTH OF LIQUID COLUMN _____ m
CURRENT WATER CUT _____ % WATER GRADIENT _____ kPa/m	OIL GRAVITY _____ OIL GRADIENT _____ kPa/m
LIQUID COLUMN PRESSURE _____ kPa	DATUM DEPTH PRESSURE _____ kPa

4. CHART READINGS AND CALCULATIONS

DATE	DEPTH BELOW CF m	TIME	DEFLECTION in mm	CALCULATED PRESSURE kPa	CORRECTION P ± PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
80/06/17	3628.9	1930	RECORDERS ON		BOTTOM		
80/06/17	3628.9	1930	23.46	38988	+5	38993	
		2000	23.45	38971	+5	38976	
		2100	23.44	38954	+5	38959	
		2200	23.44	38954	+5	38959	
		2300	23.44	38954	+5	38959	
80/06/17	3628.9	2400	23.44	38954	+5	38959	
80/06/18	3628.9	0100	23.44	38954	+5	38959	
80/06/18	3628.9	0100	WELL OPENED FOR		CLEAN UP		
80/06/18	3628.9	0115	23.39	38871	+5	38876	
		0130	23.37	38838	+5	38843	
80/06/18	3628.9	0200	23.34	38788	+5	38793	

5. FLOW RATE DATA

ATTACHED

SEE REMARKS

NOT AVAILABLE

NOT REQUIRED

REMARKS - Bottom Recorder

- The top recorder clock malfunctioned.

* Tubing pressure 30420 kPa when recorders pulled, June 21, 1980

SURVEY COMPANY BONNETT'S TEST BY D.B. COMPUTED BY H. Young CHECK BY G.M.

BONNETT'S WIRELINE SERVICE LTD.

BOX 191, GRANDE PRAIRIE, ALTA. T8V 3A4
BOX 6531, FORT ST. JOHN, B.C. V1J 4H7

PHONE 532-8288
PHONE 785-2178

POOL Nahanni WELL NAME Columbia et al Kotaneelee
DATE OF TEST 80/06/17 LOCATION YT-1-48 PAGE 2 OF 6

CHART READINGS AND CALCULATIONS

DATE	DEPTH BELOW CF. m	TIME	DEFLECTION in/mm	CALCULATED PRESSURE kPa	CORRECTION P ± PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
80/06/18	3628.9	0230	23.29	38705	+5	38710	
80/06/18	3628.9	0230	WELL SHUT IN				
80/06/18	3628.9	0245	23.46	38988	+5	38993	
		0300	23.46	38988	+5	38993	
80/06/18	3628.9	0400	23.46	38988	+5	38993	
80/06/18	3628.9	0400	WELL OPENED FOR CLEAN-UP				
80/06/18	3628.9	0415	23.37	38838	+5	38843	
		0430	23.32	38755	+5	38760	
		0500	23.31	38738	+5	38743	
80/06/18	3628.9	0525	23.31	38738	+5	38743	
80/06/18	3628.9	0525	WELL SHUT IN				
80/06/18	3628.9	0530	23.45	38971	+5	38976	
80/06/18	3628.9	0530	WELL OPENED ON 64/64" CHOKE				
80/06/18	3628.9	0545	23.34	38788	+5	38793	
		0600	23.33	38772	+5	38777	
		0630	23.32	38759	+5	38764	
		0700	23.31	38738	+5	38743	
		0730	23.31	38738	+5	38743	
80/06/18	3628.9	0800	23.31	38738	+5	38743	
80/06/18	3628.9	0800	CHOKE INCREASED				
80/06/18	3628.9	0820	23.30	38722	+5	38727	
80/06/18	3628.9	0820	CHOKE SET @ 128/64"				
80/06/18	3628.9	0830	23.29	38705	+5	38710	
		0900	23.28	38689	+5	38694	
		0930	23.28	38689	+5	38694	
80/06/18	3628.9	1000	23.28	38689	+5	38694	
80/06/18	3628.9	1000	CHOKE SET @ 42/64"				
80/06/18	3628.9	1030	23.31	38738	+5	38743	
80/06/18	3628.9	1100	23.31	38738	+5	38743	

5. FLOW RATE DATA - ATTACHED SEE REMARKS NOT AVAILABLE NOT REQUIRED

REMARKS:

SURVEY COMPANY BONNETT'S TEST BY D.B. COMPUTED BY H. Young CHECK BY G.M.

BONNETT'S WIRELINE SERVICE LTD.

BOX 191, GRANDE PRAIRIE, ALTA. T8V 3A4
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POOL Nahanni WELL NAME Columbia et al Kotaneelee
 DATE OF TEST 80/06/17 LOCATION YT-I-48 PAGE 3 OF 6

CHART READINGS AND CALCULATIONS

DATE	DEPTH BELOW CF. m	TIME	DEFLECTION in/mm	CALCULATED PRESSURE kPa	CORRECTION P ± PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
80/06/18	3628.9	1100	WELL SHUT IN				
80/06/18	3628.9	1105	23.39	38871	+5	38876	
		1110	23.41	38905	+5	38910	
		1115	23.42	38921	+5	38926	
		1130	23.43	38938	+5	38943	
		1200	23.43	38938	+5	38943	
80/06/18	3628.9	1300	23.43	38938	+5	38943	
80/06/18	3628.9	1300	WELL OPENED TO FLOW RATE #1				
80/06/18	3628.9	1315	23.38	38855	+5	38860	
		1330	23.37	38838	+5	38843	
		1400	23.37	38838	+5	38843	
		1500	23.37	38838	+5	38843	
		1600	23.36	38822	+5	38827	
80/06/18	3628.9	1700	23.36	38822	+5	38827	
80/06/18	3628.9	1700	WELL SHUT IN				
80/06/18	3628.9	1705	23.40	38888	+5	38893	
		1710	23.42	38921	+5	38926	
		1715	23.42	38921	+5	38926	
		1730	23.42	38921	+5	38926	
		1800	23.42	38921	+5	38926	
		1900	23.42	38921	+5	38926	
		2000	23.42	38921	+5	38926	
80/06/18	3628.9	2100	23.42	38921	+5	38926	
80/06/18	3628.9	2100	WELL OPENED TO FLOW RATE #2				
80/06/18	3628.9	2115	23.32	38755	+5	38760	
		2130	23.31	38738	+5	38743	
		2200	23.31	38738	+5	38743	
		2300	23.30	38722	+5	38727	
80/06/18	3628.9	2400	23.30	38722	+5	38727	
80/06/19	3628.9	0100	23.30	38722	+5	38727	
80/06/19	3628.9	0100	WELL SHUT IN				
80/06/19	3628.9	0105	23.38	38855	+5	38860	
		0110	23.40	38888	+5	38893	
		0115	23.40	38888	+5	38893	
90/06/19	3628.9	0130	23.40	38888	+5	38893	

5. FLOW RATE DATA - ATTACHED SEE REMARKS NOT AVAILABLE NOT REQUIRED

REMARKS: _____

SURVEY COMPANY BONNETT'S TEST BY D.B. COMPUTED BY H. Young CHECK BY G.M.

BONNETT'S WIRELINE SERVICE LTD.

BOX 191, GRANDE PRAIRIE, ALTA. T8V 3A4
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POOL Nahanni WELL NAME Columbia et al Kotaneelee
DATE OF TEST 80/06/17 LOCATION VT-1-48 PAGE 4 OF 6

CHART READINGS AND CALCULATIONS

DATE	DEPTH BELOW CF. m	TIME	DEFLECTION in/mm	CALCULATED PRESSURE kPa	CORRECTION P ± PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
80/06/19	3628.9	0200	23.40	38888	+5	38893	
		0300	23.40	38888	+5	38893	
		0400	23.40	38888	+5	38893	
80/06/19	3628.9	0500	23.40	38888	+5	38893	
80/06/19	3628.9	0500	WELL OPENED TO FLOW RATE #3				
80/06/19	3628.9	0515	23.28	38689	+5	38694	
		0530	23.27	38672	+5	38677	
		0600	23.27	38672	+5	38677	
		0700	23.26	38655	+5	38660	
		0800	23.26	38655	+5	38660	
80/06/19	3628.9	0900	23.26	38655	+5	38660	
80/06/19	3628.9	0900	WELL SHUT IN				
80/06/19	3628.9	0905	23.35	38805	+5	38810	
		0910	23.37	38838	+5	38843	
		0915	23.38	38855	+5	38860	
		0930	23.38	38855	+5	38860	
		1000	23.38	38855	+5	38860	
		1100	23.38	38855	+5	38860	
		1200	23.38	38855	+5	38860	
80/06/19	3628.9	1300	23.38	38855	+5	38860	
80/06/19	3628.9	1300	WELL OPENED TO EXTEND FLOW				
80/06/19	3628.9	1315	23.25	38639	+5	38643	
		1330	23.24	38622	+5	38627	
		1400	23.23	38606	+5	38611	
		1500	23.23	38606	+5	38611	
		1600	23.22	38589	+5	38594	
		2000	23.20	38556	+5	38561	
80/06/19	3628.9	2400	23.18	38523	+5	38528	
80/06/20	3628.9	0400	23.17	38506	+5	38511	
		0800	23.15	38473	+5	38478	
80/06/20	3628.9	1300	23.13	38439	+5	38444	
80/06/20	3628.9	1300	WELL SHUT IN FOR FINAL BUILD				
80/06/20	3628.9	1305	23.26	38655	+5	38660	
		1310	23.28	38689	+5	38694	
		1315	23.28	38689	+5	38694	
80/06/20	3628.9	1330	23.29	38689	+5	38694	

5. FLOW RATE DATA - ATTACHED SEE REMARKS NOT AVAILABLE NOT REQUIRED

REMARKS: _____

SURVEY COMPANY BONNETT'S TEST BY D.B. COMPUTED BY H. Young CHECK BY G.M.

BONNETT'S WIRELINE SERVICE LTD.

Subsurface Pressure Measurements - Static Test

BOX 5151, FORT ST. JOHN, B.C. V1J 4H7

PHONE 785-2178

Page 6 Of 6

COMPANY <u>Columbia Gas Development(Canada)</u>	WELL NAME <u>Columbia et al Kotaneelee</u>
ADDRESS <u>1000, 639-5 Ave., S.W., Calgary</u>	LOCATION <u>YT-I-48</u>
FIELD and POOL <u>Kotaneelee- Nahanni</u>	STATUS: OIL _____ GAS <input checked="" type="checkbox"/> OTHER: SPECIFY _____
TYPE OF TEST <u>Static Gradient</u>	DATE OF TEST <u>80/06/22</u>
PERF./OPEN HOLE INTERVAL(CF) <u>3645.9-3831.9</u> m	PRODUCING THROUGH <input checked="" type="checkbox"/> TUBING _____ CASING _____
ELEVATION(CF) <u>826.89</u> (KB) <u>834.95</u> m	MID-POINT OF PRODUCING INTERVAL(CF) _____ m
POOL DATUM _____ m (SUBSEA)	DATUM DEPTH OF WELL (+FROM CF) _____ m

TUBING PRESS. <u>30420</u> GAUGE _____ CASING PRESS. _____ (DWG) _____	SHUT-IN TIME _____ hrs.
RUN DEPTH (FROM CF) TOP <u>3627.1</u> BOT. <u>3628.9</u> m	ON BOTTOM/OFF BOTTOM <u>1148-1158</u>
TEMPERATURE AT RUN DEPTH _____ °C	SURFACE TEMPERATURE _____ °C
PRESSURE AT RUN DEPTH TOP <u>39965</u> BOT. <u>39870</u> kPa	PRESSURE AT MID-POINT OF PERFORATIONS _____ kPa
<u>Gradient @ run depth top 1.771 bottom 1.731</u> kPa/m	
ELEMENT SERIAL NO. <u>18468N</u> RANGE <u>58300</u> kPa	CLOCK RANGE <u>3</u> hours S <input checked="" type="checkbox"/> D _____ IH _____
CALIBRATION EQUATION <u>1153.80 + (-34.7)</u>	DATE OF LATEST CALIBRATION <u>80/06/12</u>

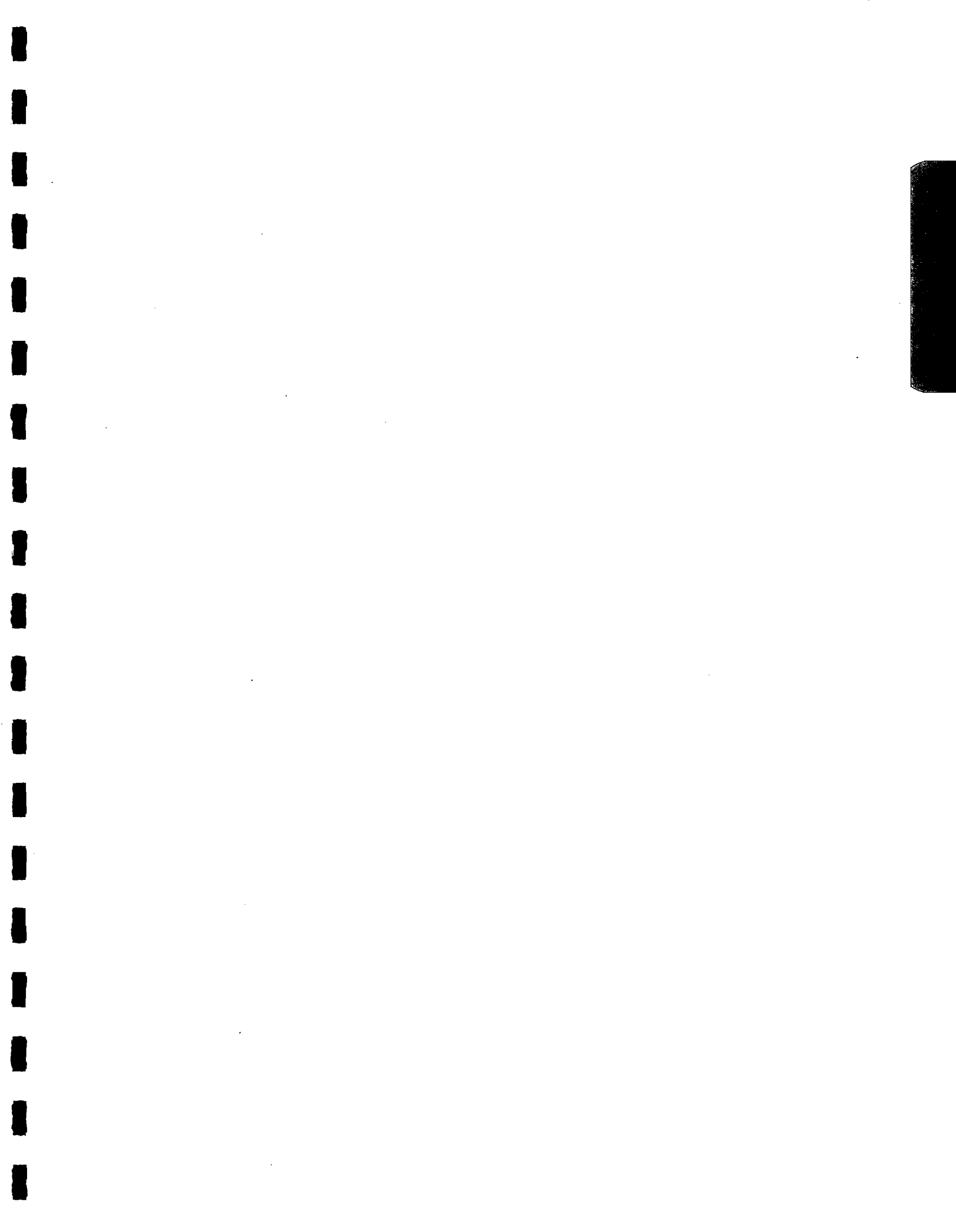
TOP RECORDER	DEPTH BELOW CF m	TIME	DEFLECTION in/mm	CALCULATED PRESSURE kPa	CORRECTION P + PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
80/06/22	FLEX ON	1033-36	26.14	30126	-32	30094	
	FLEX OFF	1036-39					
	0	1039-42	26.14	30126	-32	30094	
	303.0	1045-48	26.90	31003	-42	30961	2.844
	607.8	1051-54	27.65	31868	-42	31824	2.831
	912.6	1057-1100	28.39	32722	-42	32680	2.808
	1217.4	1102-05	29.11	33552	-42	33510	2.723
	1522.2	1107-10	29.79	34337	-42	34295	2.575
	1827.0	1112-15	30.46	35110	-49	35061	2.513
	2131.8	1118-21	31.09	35837	-49	35788	2.385
	2436.6	1124-27	31.71	36552	-49	36503	2.346
	2741.4	1130-33	32.31	37245	-49	37196	2.274
	3046.2	1136-39	32.88	37902	-49	37853	2.156
	3351.0	1142-45	33.42	38525	-49	38476	2.044
	3627.1	1148-58	33.84	39010	-45	38965	1.771

ELEMENT SERIAL NO. <u>18469N</u> RANGE <u>58600</u> kPa	CLOCK RANGE <u>3</u> hours S <input checked="" type="checkbox"/> D _____ IH _____
CALIBRATION EQUATION <u>1156.9 D + (30.8)</u>	DATE OF LATEST CALIBRATION <u>80/06/12</u>

BOTTOM RECORDER	DEPTH BELOW CF m	TIME	DEFLECTION in/mm	CALCULATED PRESSURE kPa	CORRECTION P + PC kPa	CORRECTED PRESSURE kPa	GRADIENT kPa/m
80/06/22	FLEX ON	1033-36	26.01	30060	-34	30026	
	FLEX OFF	1036-39					
	0	1039-42	26.02	30072	-34	30038	
	304.8	1045-48	26.76	30928	-37	30891	2.799
	609.6	1051-54	27.51	31796	-37	31759	2.848
	914.4	1057-1100	28.26	32663	-37	32626	2.844
	1219.2	1102-05	28.99	33508	-37	33471	2.772
	1524.0	1107-10	29.67	34294	-37	34257	2.579
	1828.8	1112-15	30.33	35058	-33	35025	2.520
	2133.6	1118-21	30.95	35775	-33	35742	2.352
	2438.4	1124-27	31.56	36481	-33	36448	2.315
	2743.2	1130-33	32.15	37164	-33	37131	2.241
	3048.0	1136-39	32.69	37788	-33	37755	2.047
	3352.8	1142-45	33.24	38425	-33	38392	2.090
	3628.9	1148-58	33.65	38899	-29	39870	1.731

REMARKS -NO FLUID LEVEL

SURVEY COMPANY BONNETT'S TEST BY D.A. COMPUTED BY H. Young CHECKED BY G.M.



COLUMBIA ET AL KOTANEELEE YT I-48

June 13, 1980

0600 Arrived on location. Rig up Nowsco and hot oil unit in preparation for acid frac job. Mixed additives and heat acid.
 1625 Pressure tested lines to 66500 kPa and pressured annulus and held at 21000 kPa for duration of treatment.
 1725 Started 15% HCl acid and additives down tubing and achieved following pressures and rates.

<u>TIME</u>	<u>CASING PRESSURE</u>	<u>TUBING PRESSURE</u>	<u>FLUID INJECTION RATE</u>
1725	21000	30000	-
1732	21000	24000	1.6 m ³
1745	21000	30000	2.8
1747	21000	22000	2.3
1805	21000	26000	2.8
1824	21000	32200	3.0
1830	21000	35000	3.3

Total acid, flush and CO₂ - 165.5 m³
 Maximum injection pressure - 45 500 kPa

Job completed at 1850 hrs. Shut well in. Rig out and move to next location.

2030 Rig up flare line and flare stack.
 2330 Shut in tubing pressure - 4100 kPa, open well to flare to clean up on 37.3mm choke.

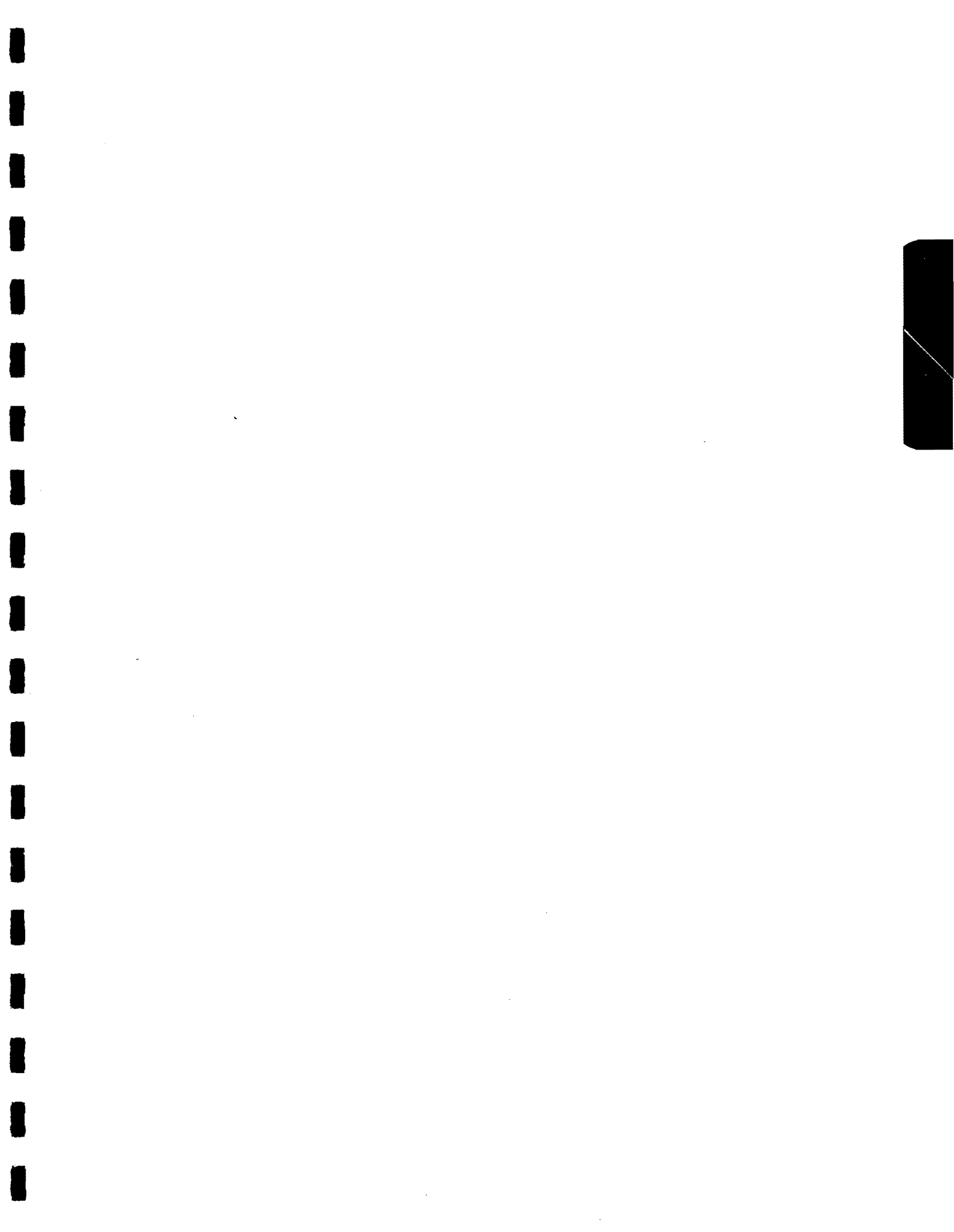
<u>TIME</u>	<u>FLOWING TUBING PRESSURE</u>	<u>CHOKE SIZE</u>	<u>TEMPERATURE</u>
0100	9480	37.3mm	
0300	7067	50.8	48 C
0500	7067	50.8	55 C
0800	7412	50.8	61 C

June 14, 1980

0800-2400 Flowing well to flare stack to clean up.

<u>TIME</u>	<u>FLOWING TUBING PRESSURE</u>	<u>CHOKE SIZE</u>	<u>TEMPERATURE</u>
1200	17237	25.4	75 C
1600	17581	25.4	70 C
2000	17754	25.4	85 C
2400	17754	25.4	87 C

Well shut in at 2400 hrs. Temperature stabilized at 87^oC for last 2 hours. Wellhead pressure increased to 32 405 kPa immediately when well was shut in. Future operation - run AOF test.





CHEMICAL & GEOLOGICAL LABORATORIES LTD.

EDMONTON FORT ST. JOHN CALGARY



CONTAINER IDENTITY

WATER ANALYSIS

LABORATORY NUMBER

C80-1165

LICENCE NUMBER

OPERATOR NAME

COLUMBIA GAS DEVELOPMENT OF CANADA LTD. 639 - 5 Ave. S.W., Calgary

CPA NUMBER

WELL NAME

Columbia et al Kotaneelee YT-I-48

ELEVATIONS
K.B. (metres) GRD

FIELD OR AREA

POOL OR ZONE

NAME OF SAMPLER

COMPANY

Porta Test

TEST TYPE

NO.

TEST RECOVERY

MULTIPLE RECOVERY

Y N

SAMPLING POINT

AMT. & TYPE OF CUSHION

MUD RESISTIVITY

Separator

Test Interval (metres)

TYPE OF PRODUCTION

PUMPING

FLOWING

GAS LIFT

SWAB

PRODUCTION RATES

WATER

m³/d OIL

m³/d GAS

10³m³/d

Perforations (metres)

SEPARATOR

TREATER

RESERVOIR

SOURCE

GAUGE PRESSURE kPa

SEPARATOR

TREATER

RESERVOIR

SOURCE

TEMPERATURE °C

DATE SAMPLED (Y-M-D)
1980-06-30

DATE RECEIVED (Y-M-D)
1980-07-03

DATE REPORTED (Y-M-D)
1980-07-09

ANALYST
D. Barber

OTHER INFORMATION

ION	$\frac{m \cdot V^{-1}}{g \cdot m^{-3}}$	Mass Fraction	$\frac{c}{mol \cdot m^{-3}}$	ION	$\frac{m \cdot V^{-1}}{g \cdot m^{-3}}$	Mass Fraction	$\frac{c}{mol \cdot m^{-3}}$
Na	290	0.0085	12.62	Cl	23 250	0.6785	655.65
K	20	0.0006	0.51	Br			
Ca	6 567	0.1916	163.85	I			
Mg	3 694	0.1078	151.83	HCO ₃	409	0.0119	6.71
Ba				SO ₄	37	0.0011	0.39
Sr				CO ₃	0	0.0000	0.00
Fe	PRESENT			OH	0	0.0000	0.00

TOTAL SOLIDS	$\frac{m \cdot V^{-1}}{g \cdot m^{-3}}$
EVAPORATED @ 110°C	44 930
AT IGNITION	26 440
CALCULATED	34 267

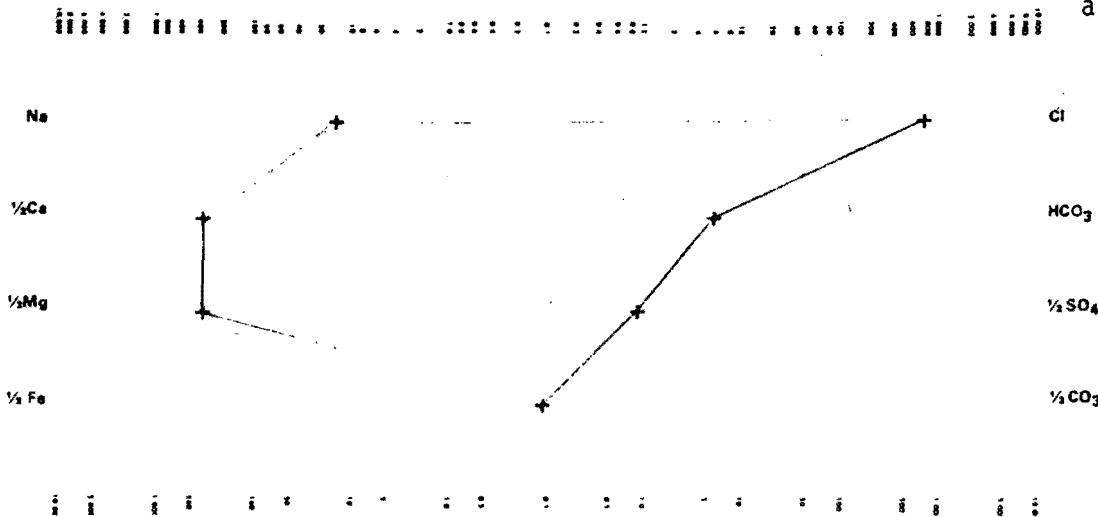
ORGANICS: PRESENT
 RELATIVE DENSITY @ 20°C: 1.023
 REFRACTIVE INDEX @ 20°C: 1.3411
 OBSERVED pH: 4.8 @ 23°C
 RESISTIVITY @ 25°C: 0.203

H₂S NIL

REMARKS

Yellow filtrate recovered from a sample containing a trace of sediment.

LOGARITHMIC PATTERN $c / mol \cdot m^{-3}$







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EDMONTON FORT ST JOHN CALGARY



GAS ANALYSIS

5091, 5021

C80-1638

COLUMBIA GAS DEVELOPMENT OF CANADA LTD. 639 - 5th Ave. S.W. Calgary

Columbia et al Kotaneelee YT-I-48

Porta Test

OPERATOR NAME, WELL NAME, FIELD OR AREA, NAME OF SAMPLER, TEST RECOVERY

SAMPLING POINT: Separator, AMT & TYPE OF CUSHION, MUD RESISTIVITY

TYPE OF PRODUCTION, PRODUCTION RATES, GAUGE PRESSURE, TEMPERATURE, ANALYST: B. Anderson

DATE SAMPLED: 1980-06-20, DATE RECEIVED: 1980-07-07, DATE REPORTED: 1980-07-10

Table with columns for MOLE FRACTION (AIR FREE AS RECEIVED, AIR FREE ACID GAS FREE), PETROLEUM LIQUID CONTENT, GROSS HEATING VALUE (MEASURED, CALCULATED), RELATIVE DENSITY (MEASURED, CALCULATED), PSEUDO CRITICAL PROPERTIES (CALCULATED), and various gas components (H2, He, N2, CO2, H2S, C1-C10, TOTAL).